NTHROPOMORPHISM AND SCIENCE

OLIVE A. WHEELER, M. Sc.

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A STUDY OF THE DEVELOPMENT OF EJECTIVE COGNITION IN THE INDIVIDUAL AND THE RACE

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[*Thesis approved for the Degree of Doctor of Science in the University of London*]

LONDON: GEORGE ALLEN & UNWIN LTD.
RUSKIN HOUSE 40 MUSEUM STREET, W.C.

First published in 1916

PREFACE

THIS study of ejective cognition embodies some of the results of my work as a Research Fellow of the University of Wales, and is printed in substantially the same form in which it was approved for the degree of Doctor of Science in Psychology in the University of London. It is pre-eminently an attempt to solve a problem, which is greatly exercising the modern mind, namely, that of the relation which exists between theological and scientific interpretations of the world. The treatment is divided into three parts. The first, which is mainly historical, is a consideration of the *philosophical* doctrine of ejection. The second traces the development of the *psychological* process of ejection in the history both of the individual and of the race. And the third uses the generalizations discovered in the psychological investigation to throw light on the problem, which it is the main objective of the essay to solve. Parts II and III, with the Introduction, therefore form a complete whole, so far as the main problem is concerned; but Part I has been included for the sake of those readers who would desire to orientate the doctrine of ejection with other philosophical systems.

I have to express my sincere acknowledgment to

Dr. J. Brough for his interest and valuable advice throughout the whole period of the research, and, in addition, for his aid in proof-correcting. Professor Stout, Professor Mackenzie, and Dr. Edgell have also read this work in manuscript form, and I have to thank them for many helpful suggestions. I am also indebted to Dr. Wildon Carr and Dr. H. J. Fleure for some minor criticisms.

I should like also to avail myself of this opportunity to express my gratitude to Professor Bergson for his kindness and for the inspiration received from him during my residence in Paris. And, in conclusion, my thanks are due to the University of Wales for electing me to a Fellowship, and thus enabling me to pursue my research work at the Universities of London and Paris.

O. A. W.

CHELTENHAM LADIES' COLLEGE,
January 1916.

CONTENTS

SECTION II

The Development of Ejective Processes: A Phylogenetic Study

PART III

THE RELATION BETWEEN A THEOLOGICAL, A METAPHYSICAL, AND A SCIENTIFIC INTERPRETATION OF THE WORLD

ANTHROPOMORPHISM AND SCIENCE

INTRODUCTION

THE PROBLEM

No sane man has ever been at heart a solipsist. Occasionally there has arisen a man who has maintained for the sake of argument that he alone existed and that all else—his fellows, animate and inanimate objects—were but the product of his own creative activity. Possibly, too, there have been times in the lives of most men when all things have appeared as phantasmagoria, having the ground of their existence in that pulsing conscious life of self in comparison with which they seem so unreal. The very men who have it in their power to thwart or aid us in the attainment of our ends, to narrow or enlarge our fields of action, appear at times to be far away and to be figures created by our own restless fancies. And yet the normal man acts as though he were as certain of the existence of other men as he is of his own. He does not regard himself as the only experient and other men as

mere presentation complexes given to him in experience. He does not even "see men as trees walking," but without hesitation he interprets them as being conscious purposive beings like himself. And no matter how impregnable the solipsist's position may be theoretically, it certainly fails to pass the pragmatic test of truth. It will not work in actual everyday life. Solipsism may be theoretically possible, but it is practically absurd. Yet this fact does not in itself do away with the necessity for an examination of the process by which the alternative view is reached, that there exist other men who are themselves centres of experience, and also that there are objects having a ground of existence independent of my perceptions of them.

Now my knowledge of self is essentially different from my knowledge of all other objects, including my fellow-men. I can never directly experience another man's thoughts and feelings, nor can I even know directly that he has any thoughts and feelings. Take the simplest possible case as an example. If I suffer pain, the experience is a fact of indubitable certainty. But if another man suffers, the pain is not directly and immediately apprehended by me. How then do I know of its existence? I believe that he suffers because I interpret his expressions, words, and other external accompaniments in the light of my own direct experience of pain. His pain is not, and never can become, an *object* to me. It is an *eject*—something directly known only in myself which is *thrown out* of myself and assumed to be in him.

Baldwin has defined an *eject* as "some one else thought of in terms of the thinker's own consciousness of himself."[1] Ejection would therefore be the process by which a thinker comes to interpret some one else as having subjective experiences known directly only in himself. But, since it is possible to have an ejective interpretation not only of persons but of things also, the word ought to be given a somewhat broader meaning. Whenever a thinker uses his consciousness of himself to interpret his fellows, or whenever he uses any single subjective experience to interpret their outward behaviour, he is making use of ejection. And he is also using it whenever there is present in his interpretation of an object an element not directly presented in perception but derived from the analysis of his own subjective experiences. Ejection might therefore be defined as that process by which a thinker uses his own subjective experiences or elements derived from their analysis to interpret some one or some thing other than himself.

This definition immediately raises the question as to how far ejection influences one's interpretation of one's environment. In the strict sense of the word, are there any *objects* of thought at all, or are all objects in reality *ejects*? Few would deny that a man's interpretation of his fellows is mediated by his knowledge of himself, but to suggest that there is an ejective element in his interpretation of objects is to raise a question which has important and far-reaching bearings upon the claims of modern science.

[1] *Dictionary.*

It is with the definite purpose of raising this question that this study of ejection has been undertaken.

Goethe has epigrammatically remarked that "man never realizes how anthropomorphic he is," and the positive scientist who is supposed to regard all tendencies to anthropomorphism as relics of savage thought is probably no exception to this general rule. He may realize that poets and theologians make use of ejection and seek the meaning of natural phenomena in the light of their own subjective experiences. The "taint" of anthropomorphism is therefore upon them, but such a realization may merely lead the scientist to be thankful "that he is not as other men are." He sometimes claims to be dealing solely with objective facts in relation to objective facts, and does not consider whether the fulfilment of such a claim is within the limits of possibility. Yet in the case of at least one science such a claim is obviously untenable, for much of the data of psychology admittedly rests on the use of ejection. My neighbour's thoughts, feelings, and conations are and must ever remain ejects to me. They can never become objects. If it is illegitimate to interpret the observed behaviour of others by analogy to self, it is difficult to see how there can be a science of psychology as distinct from a science of physiology. True, it would still be open to an investigator to study his own mind by introspection and retrospection, but the results of such observation would ever remain matters of mere opinion unless there were comparison between observers. And such comparison implies the inter-

pretation of the statements of others (one mode of their behaviour) in the light of the investigator's own experiences. Psychology, then, cannot claim to be dealing with the purely objective, and this fact probably accounts for the dubious and tardy recognition accorded to it by some natural scientists. Since there is thus one science which depends for its data on the use of ejection, the question arises: Is there also an ejective factor in the physical sciences? Is the difference between psychology and the physical sciences one of degree? If at present there is such a factor in the findings of physical science, can it ever be eliminated and can science ever attain to her ideal of method and substantiate the claim to be dealing with the purely objective? And if she can, does not this very ideal limit her sphere and debar her from finding the full meaning of the phenomena she investigates?

Such considerations show the need at the present time for a re-examination of the whole problem of ejection, a need which is the more urgent not only because of the rapid development of modern physical science, but also because there are signs of a movement in science itself towards a recognition of the provisional nature of its conclusions. I propose to undertake this examination with the hope that some light will thus be thrown upon the limits of scientific knowledge and upon the problem of the relation that obtains between a theological, a metaphysical, and a scientific interpretation of the universe.

PART I

GENERAL PHILOSOPHICAL CONSIDERATION OF EJECTION

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CHAPTER I

THE DOCTRINE OF EJECTION

AN ACCOUNT OF ITS HISTORICAL DEVELOPMENT

It was late in the history of speculative thought before any definite attention was paid by the philosopher to the evidences for the existence of the minds of his fellows, and before any attempt was made to examine critically and to justify the process by which he attained to his belief that other men like himself were centres of experience, of thought, feeling, and desire. And this is scarcely surprising when it is remembered that such a belief is instinctive and is necessary in practice for the maintenance of life. At first it would not be investigated, it would rather be acted upon, it would be "lived." Only after the inner aspects of experience had been emphasized, and the question of the relative mediacy and immediacy of different kinds of knowledge had arisen, would the universal belief in other men's minds be critically examined.

As Schopenhauer has well said, Descartes has done for Metaphysics what Bacon did for Physics, namely, begun at the beginning. Like Augustine, he took as the starting-point of his philosophical system the immediately given fact of his own existence—the only fact, he claimed, which could not be doubted. His methodical scepticism obviously implies a doctrine of the relative mediacy of all other knowledge as compared with the knowledge of the existence of self. So it might naturally have been expected that this "universal doubter" would have critically examined his belief in the existence of his fellow-men. But, surprising as it is, the fact remains that after advocating a method of reaching philosophical truth by doubting all that can be doubted, Descartes did not directly consider whether he was justified in assuming the existence of human minds or "rational souls" other than his own; and this, notwithstanding the fact that the bodies, in which these "souls" were supposed to abide, had to pass through the crucible of his doubt with the rest of the material world. Just as the searchlights of a battleship may miss some boat which sails too near to be seen, so Descartes' method, which was intended to estimate critically any and every item in his system of knowledge, missed the minds of other men. It seems that his scepticism was checked with his proofs of the existence of God and of the external world, and he was thus led to imagine that the whole battle had been won.

But although Descartes is nowhere directly concerned to discuss whether he is justified in his belief

in the existence of other human minds, he indirectly alludes to some of the evidence on which that assumption is based in his treatment of the difference between men and animals. If, as he believed, mechanical principles were sufficient to explain all animal reactions, what was to prevent his regarding men as mere machines likewise? His "Cogito, ergo sum" took him no further than his own existence. Why, then, should he believe that, unlike animals, men possessed minds analogous to his own? He himself gives the following answer. Men are distinguished from mere automata and proved to possess "rational souls" by two facts—their use of speech and their power of adaptation to new conditions. For machines can "never use speech or other signs as we do when placing our thoughts on record for the benefit of others"; and, although they "can perform certain things as well as or perhaps better than any of us can do, they infallibly fall short in others, by the which means we may discover that they did not act from knowledge, but only from the disposition of their organs." [1]

Obviously Descartes has here stumbled upon some of the evidence in the light of which man is led to believe in the existence of the minds of his fellows. But he does not consider whether the evidence is sufficient to justify that belief. He is merely concerned to show the limits of his mechanical explanations of the universe, and to that end he makes use of the generalization that the powers of speech and adaptation to new conditions are connected with

[1] *Works*, edited by Haldane and Ross, 1911, vol. i. p. 116.

the presence of a mind. But how did he come to know of this supposed correlation? By comparison of his fellow-men one with another? True, by this he might discover, for example, that they agreed in their use of speech, but he could never know by this alone that speech was an indication of the presence of mind. That is, he could never be directly conscious in the case of another man of the inner thought which expressed itself outwardly in speech. If he had taken such a line of reflection, he would have seen that the logical ground for his belief—that speech and adaptative movements are indicative of mind—lay ultimately in his knowledge of himself as a thinking being expressing his thoughts in speech and outwardly adapting himself to new conditions because of his inward realization of their significance.

Descartes' assumption of the existence of "rational souls" rests then upon a process of ejection, an interpretation of others in the light of the interpreter's subjective experience. Such a process might be stated explicitly in the form of the following analogical argument :—

> "I know that in my own case speech and adaptative movements are the outer correlatives of inner thoughts and purposes; they are the outer marks of the possession of a 'rational soul.' When therefore I see like marks in my fellow-men, I infer that they also possess reason."

But Descartes did not consider the ground for his belief in the connexion between the possession of a "rational soul" and the possession of powers of speech and adaptative movement. If he had,

he would have been forced to attack the problem which finds a solution in the doctrine of ejection. As it was, it was left to his disciple Malebranche to consider explicitly how we know of the existence of finite minds other than our own.

In his most important work *De la Recherche de la Vérité*, Malebranche distinguishes four kinds of knowledge, differing in degree of immediacy. First, there is the immediate knowledge of Being in general—of God, by which and in which alone we perceive all particular existences. "Il n'y a que Dieu que nous voyions d'une vue immédiate et directe ; il n'y a que lui qui puisse éclairer l'esprit par sa propre substance." [1]

Secondly, there is knowledge of material things through ideas ; and, in the third place, man has a sense of self, not by way of idea, but through inner and apparently inarticulate feeling. And lastly, there is knowledge of the minds of other men, which is even less direct than knowledge of material things. In Malebranche's opinion it is merely knowledge "by conjecture."

"De tous les objets de notre connaissance, il ne nous reste plus que les âmes des autres hommes et que les pures intelligences, et il est manifeste que nous ne les connaissons que *par conjecture*. Nous ne les connaissons présentement ni en elles-mêmes ni par leurs idées ; et, comme elles sont différentes de nous, il n'est pas possible que nous les connaissions par conscience. Nous *conjecturons* que les âmes des autres hommes sont de même

[1] Malebranche, *Works*, edited by Simon, 1842, vol. ii. p. 262.

espèce que la nôtre. Ce que nous sentons en nous-mêmes, nous *prétendons* qu'ils le sentent. . . ." [1]

Malebranche, then, realized that we use our experience to interpret that of our fellows, but he failed to justify such an interpretation. He was rather forced to the conclusion that "the knowledge which we have of other men is peculiarly subject to error, when we judge of them only by the feelings which we have of ourselves." And neither did he find the conditions under which such a mode of procedure is permissible. Take, for example, one of the illustrations used by him. "I have desire for or aversion towards such and such a thing and I judge that others resemble me; my conjecture is often false." He does not raise the question as to what determines whether the conjecture is to be true or false. If his analysis of this knowledge "by conjecture" had gone deeper, he would have seen that he would be justified in assuming that others had an internal experience of desire or aversion if there was specific resemblance between the external expression of the desire or aversion which he experienced and their observable expressions. But it is absurd to make any conjecture if we leave out of account the external accompaniments of their feelings, that is, "if we judge of them *only* by the feelings which we have of ourselves." Because I feel warm I am not justified in supposing that other men feel warm unless I have evidence that they resemble me in the outward expression of their feelings.

[1] *Works*, vol. ii. p. 265.

True, from general external resemblances, general internal resemblances can be inferred. This is the first of the two cases distinguished by Malebranche in the quotation given above, in which "we conjecture that the souls of other men are of the same *kind* as our own." But in the second case, in which we suppose that other men have particular experiences like those we feel in ourselves, the interpretation is only legitimate if there are specific resemblances between the external accompaniments of our experience and those of the supposed experience of another. But Malebranche was not content with this. He wished to pass from general external resemblance to specific internal resemblances, and he was therefore bound to confess that "when the body plays some part in what happens within me, I am nearly always deceived if I judge of others by myself." [1]

He is thus left with a knowledge of his fellow-men vitiated by errors on every hand, and he finds it necessary to supplement this knowledge "by conjecture" with another kind of knowledge, which might not unjustly be described as knowledge by revelation. We have immediate knowledge in God of certain immutable laws according to which He will act in all minds; and we therefore know positively what other minds experience in certain cases. For example, we know with certainty, not merely by conjecture, that all men desire happiness. "I desire to be happy," says Malebranche, "and I am not deceived in believing that men, angels, and

[1] *Works*, vol. ii. p. 265.

even demons have similar desires. I even know that God will never make minds who do not desire to be happy or who can desire to be unhappy; but I know it with clearness and certainty, for it is God who teaches it me." [1]

It is not necessary here to do more than point out the mistake Malebranche has made in regarding a generalization which has been reached empirically as an *a priori* truth, directly revealed to him by God. For it would scarcely be denied to-day that the generalization that all men desire to be happy is based on the observed behaviour of men interpreted in the light of individual experience. It may have an added certainty because it is consistent with and explains wide classes of phenomena, but nevertheless it was arrived at through ejection and induction and not through immediate revelation.

But even if we grant for the moment that we "know with certainty that God acts equally in all minds," and that therefore, if there are other men, they like ourselves will desire happiness, the question arises: How do we know that other minds exist for God to act in? This unanswered question shows the incompleteness of Malebranche's analysis of our knowledge of our fellow-men. Yet his definite affirmation that "we conjecture that the souls of other men are of the same kind as our own" implies a realization of the fact that our knowledge of others is mediated by our knowledge of self, and accordingly marks a step towards the formulation of the

[1] *Works*, vol. ii. p. 265.

doctrine of ejection, according to which, in the words of Baldwin, other men are "thought of in terms of the thinker's own consciousness of himself."

Locke agrees with Malebranche that the world of spirits can scarcely be said to be "known" by us. As he puts it, "almost the whole intellectual world" is concealed from us "in an impenetrable obscurity." "For," he continues, "bating some very few, and those, if I may so call them, superficial ideas of spirit, which by reflection we get of our own, and from thence the best we can collect of the Father of all spirits, the eternal independent Author of them, and us, and all things, we have no certain information, so much as of the existence of other spirits, but by revelation. Angels of all sorts are naturally beyond our discovery; and all those intelligences, whereof it is likely there are more orders than of corporeal substances, are things whereof our natural faculties give us no certain account at all. That there are minds and thinking beings in other men as well as himself, every man has a reason, from their words and actions, to be satisfied: and the knowledge of his own mind cannot suffer a man that considers to be ignorant that there is a God. But that there are degrees of spiritual beings between us and the great God, who is there that, by his own search and ability, can come to know? Much less have we distinct ideas of their different natures, conditions, states, powers, and several constitutions wherein they agree or differ from one another and from us. And, therefore, in what concerns

their different species and properties we are in absolute ignorance."[1]

It is evident from this paragraph alone that Locke believed that our knowledge of the nature of the minds of other men is gained by the use of analogy and depends ultimately on self-knowledge. And in his consideration of the origin of our complex ideas of substances he shows that we frame the complex idea of an immaterial spirit by "putting together the ideas of thinking, perceiving, liberty, and power of moving themselves and other things," that is, by combining ideas gained by reflection on the operations of our own minds. Further, in Locke's view, this idea of an immaterial spirit is at least as clear as that of a material body. Both are complex ideas formed by combining simple ideas (in the one case, of reflection; in the other, of sensation), and the substance or support for these ideas is equally obscure in the two cases. "So that, in short, the idea we have of spirit, compared with the idea we have of body, stands thus: the substance of spirit is unknown to us; and so is the substance of body equally unknown to us. Two primary qualities or properties of body, viz. solid coherent parts and impulse, we have distinct, clear ideas of: so likewise we know, and have distinct, clear ideas of two primary qualities or properties of spirit, viz. thinking and a power of action; i.e. a power of beginning or stopping several thoughts or motions."[2]

[1] Locke, *Works*, edited by John, 1843. *Essay concerning Human Understanding*, Bk. IV, ch. iii. § 27.

[2] *Essay concerning Human Understanding*, Bk. II, ch. xxiii. § 30.

This, then, is Locke's view of the nature and origin of our ideas of minds or spirits. But there is also the further question whether these ideas correspond to actual *existences* or not. Malebranche had not distinguished the two questions, and therefore in his treatment of "knowledge by conjecture" he dealt with points which were in Locke's view "beside his business," his business there being to examine what ideas we have, and how we came by them. "So that the thing here considered should, in my opinion, be, not whether there were any souls of men or pure intelligences anywhere existing, but what ideas we have of them, and how we came by them. For when he (Malebranche) says, we know not angels, either 'in themselves,' or 'by their ideas,' or 'by consciousness,' what in that place does 'angel' signify? What idea in him does it stand for? Or is it the sign of no idea at all, and so a bare sound without signification?" [1]

It is clear that Locke himself distinguished between the "ideas" of spirits which we gain through reflection and our belief in their existence. "The having the idea of anything in our mind no more proves the *existence* of that thing than the picture of a man evidences his being in the world or the visions of a dream make thereby a true history." [2] Even supposing that the question of the origin of our ideas of spirits is satisfactorily answered there still remains unsolved a second problem—that of the evidence for the existence of real entities

[1] *An Examination of P. Malebranche's Opinion*, § 51.

[2] *Essay concerning Human Understanding*, Bk. IV, ch. xi. § 1.

corresponding to these ideas. For example, he says :—

"What ideas we have of spirits, and how we come by them, I have already shown. But though we have those ideas in our minds, and know we have them there, the having the ideas of spirits does not make us know that any such things do exist without us, or that there are any finite spirits or any other spiritual beings, but the eternal God. We have ground, from revelation, and several other reasons, to believe with assurance that there are such creatures : but our senses not being able to discover them, we want the means of knowing their particular existences. For we can no more know that there are finite spirits really existing by the idea we have of such beings in our minds, than by the ideas any one has of fairies or centaurs, he can come to know that things answering those ideas do really exist." [1]

In conjunction with the passages quoted earlier, this might fairly be interpreted to mean that Locke realized that the knowledge which we have of the particular *nature* of other minds comes to us by analogy with self, but that our belief in the *existence* of such minds comes to us in some other way—"from revelation and several other reasons." This distinction would be somewhat analogous to Malebranche's separation of our knowledge of minds into "knowledge by conjecture" and "knowledge by revelation," but it would certainly be less open to attack. Malebranche assumed that we have know-

[1] *Essay*, Bk. IV, ch. xi. § 12.

ledge by revelation not only of the *existence* but also of the *nature* of finite minds, a contention which cannot be sustained. On the other hand, the distinction between our indirect knowledge of the nature of other minds and our belief in their existence has a certain value in the direction of the clear statement of this problem.

But although not explicitly stated, it is possible that Locke only meant to find the ground for the existence of disembodied spirits in revelation. He may never have clearly formulated the question as to the evidence for the existence of the minds of his fellows. And it may therefore be unfair to his general discussion to interpret his pronouncements on the evidence for the existence of spirits as applying to the souls of living men. Suppose, then, that he regarded his fellow-men as entities and scarcely separated even in thought their bodies and spirits. Where, in this case, would he find evidence that there actually exist these "cognitative beings"? It is not difficult to see that Locke's reply is to a certain extent wrapt up in his treatment of the general problem of the relations between the ideas in our minds and the existences supposed to correspond to them. "As to real existence," he says, "since that has no connexion with any other of our ideas, but that of ourselves and of a First Being, we have in that, concerning the real existence of all other beings, not so much as demonstrative, much less a self-evident knowledge: and, therefore, concerning those there are no maxims." [1] In other words, the

[1] *Essay*, Bk. IV, ch. vii. § 7.

idea of self and the idea of God are the only ideas which are perceived to be necessarily connected with real existence. The real existence of all finite beings other than oneself, both "cognitative" and "incognitative," is neither intuitively nor demonstratively known, but it is given by "sensation." It is "the actual receiving of ideas from without that gives us notice of the existence of other things, and makes us know that something doth exist at that time without us, which causes that idea in us; though perhaps we neither know nor consider how it does it." [1]

And further, the fact that our different senses often bear witness to the truth of each other's report should be interpreted to mean that there exist "things." The data of sense are not isolated phenomena, but they have a harmonious and natural order—a sure mark that "they are not barely the sport and play of my own imagination." Or in modern terminology, it is the correspondence between the findings of the different senses which is the ground for our referring different "sensibles" to a common source. Although not so certain as our knowledge of our own or God's existence, the assurance that there is a world of "substances" without us, on which our sensations depend, is yet in Locke's view worthy of the name of knowledge. Such an argument as this certainly might serve to show that there are other human bodies, but in itself it is insufficient to prove that there are other "cognitative" beings. It is, however, eked out by another line of thought to be found in Locke's treatment of

[1] *Essay*, Bk. IV, ch. xi. § 2.

"active and passive powers." He had shown that "powers make a great part of our complex ideas of substances": [1] and that whereas "our idea of body is an extended solid substance, *capable of communicating motion by impulse*," that is, is a passive power; "our idea of soul, as an immaterial spirit, is of a substance that thinks, and *has a power of exciting motion in body, by willing, or thought*," that is, it is an active power.[2] Now these two kinds of groups of "ideas" are found to be interrelated as causes and effects, so that change in one is correlated with change in another. The harmonious interaction is itself evidence of the actual *existence* of substances or centres of active and passive powers, corresponding to these ideas. "Since whatever change is observed, the mind must collect a power somewhere able to make that change, as well as a possibility in the thing itself to receive it."[3] To take a specific example, suppose I am watching a man who breaks a window. There is a change in a group of ideas designated "man" and a correlated change in the group of ideas—the window. This causal connexion is evidence that both the man and the window are something more than groups of ideas in my mind. They exist as centres of power, independently of my perceiving them. The man and the window differ from one another essentially in that the former initiates the change and the latter only suffers it passively. According to Locke there is evidence from the causal interaction between separated groups

[1] *Essay*, Bk. II, ch. xxiii. § 10.
[2] Ibid. § 22. [3] Ibid. ch. xxi. § 4.

of ideas for the existence of separate sources of powers. And therefore there exists an external reality, consisting of material substances which are wholly passive and finite spiritual substances which are partially active. We have therefore the right to suppose that there exist "cognitative" as well as "incognitative" beings. It must be acknowledged that Locke's statement of the argument is both crude and confused, but at the same time it is suggestive.

To sum up, then: our *ideas* of minds are gained from reflection on our own mental operations. They are therefore limited by the knowledge which we possess of our own minds. And from revelation and certain supporting arguments we are justified in assuming that there are actual beings corresponding to these ideas.

Berkeley's position on this question will be readily seen to present some marked contrasts to Locke's view, although it is its natural development. In the first place, Berkeley makes a clear distinction between "ideas" and "notions." The word "idea" is restricted to mean the immediately perceived and the imagined. And since a spirit cannot be phenomenalized, we cannot have an "idea" of it any more than we can have an "idea" (in the Berkeleyan sense) of the relations that exist between "ideas" themselves. We may be said, however, "to have some knowledge or notion of our own minds, of spirits and active beings whereof in a strict sense we have not ideas. In like manner we know and have a *notion* of relations between things or ideas, which

relations are distinct from the ideas or things related, inasmuch as the latter may be perceived by us without our perceiving the former. "To me," Berkeley adds, "it seems that ideas, spirits, and relations are all, in their respective kinds, the object of human knowledge and subject of discourse, and that the term 'idea' would be improperly extended to signify everything we know or have any notion of." [1] We have, then, *notions* of other minds, but how do we come by them? Berkeley's answer to this question is practically the same as that of Locke. "We comprehend our own existence," he says, "by inward feeling or reflection, and that of other spirits by reason." Our knowledge of other minds is not given us directly. We do not become aware of them by entering into their consciousness but by inference, based partly on our own consciousness of ourselves and partly on the signs of similar conscious life in them, implied in our perceptions of their corporeal actions. This opinion is expressed quite definitely in the following paragraph :—

"It is plain that we cannot know the existence of other spirits otherwise than by their operations, or the ideas by them excited in us. I perceive several motions, changes, and combinations of ideas, that inform me there are certain particular agents, like myself, which accompany them and concur in their production. Hence, the knowledge I have of other spirits is not immediate, as is the knowledge of my ideas; but depending on the intervention of ideas,

[1] *Principles*, § 89.

by me referred to agents or spirits distinct from myself, as effects or concomitant signs." [1]

The fourth dialogue of *Alciphron* is interesting in this connexion, for in it there is the same clear recognition that neither animal spirits nor the souls of other men are objects of sense. They are only "inferred from appearances which are perceived by sense." From this it is deduced that "the being of things imperceptible to sense may be collected from effects and signs or sensible tokens"; and use is made of this principle for proving the existence of God.

"By the person Alciphron is meant an individual thinking thing, and not the hair, skin, or visible surface, or any part of the outward form, colour, or shape of Alciphron," says Euphranor to his opponent.

And Alciphron replies: "This I grant."

"And, in granting this," continues Euphranor, "you grant that, in a strict sense, I do not see Alciphron, i.e. that individual thinking thing, but only such visible signs and tokens as suggest and infer the being of that invisible thinking principle or soul."

Berkeley has apparently no doubts regarding the legitimacy of this process of going beyond the sense data and reading-in that "invisible thinking principle or soul," which is certainly not immediately presented. And yet it is questionable whether the admission of the legitimacy of this inference is consistent with the fundamental principles of his

[1] *Principles*, § 145.

philosophy. Reid has said that Berkeley's principles, developed to their logical conclusion, would deprive us of "family, friends, country, and every human creature; of every object of affection, esteem, or concern, except ourselves." For "all the objects I see, and hear, and handle, are only the ideas of my own mind; ideas are my only companions. Cold company indeed! Every social affection freezes at the thought!" [1]

The fact remains, however, that Berkeley was not prepared to see his principles so developed. At the risk of a charge of inconsistency he affirmed the existence not only of God but of other finite spirits or percipients. This is remarkable when it is remembered that at the same time he explicitly denied the legitimacy of the common-sense reading-in of a material substratum in which the qualities of bodies might be supposed to inhere. In contradistinction to Locke he affirmed that there was "no other substance than spirit or that which perceives." Locke's second kind of substances—bodies—are groups of ideas, which exist in minds but never subsist by themselves. Their very being consists only in their being perceived, and their objectivity depends on the fact that God calls them forth in a regular order. That there exist substances, or bodies, differing from and causally related to these ideas is resolutely denied by him.

Now it is not difficult to see that a similar line of criticism to that which led Berkeley to the negation of material substances could be and indeed

[1] Reid, *Essays*, 1803, vol. ii. p. 325.

has been applied (notably by Hume) to the belief in spiritual substances. Suppose for a moment that the Berkeleyan principle that the "esse" of material things consists in "percipi" be admitted. Then the bodies of our fellow-men do not subsist in themselves, but God causes in us the ideas that we have of them. Why then should He not also cause the notions that we have of their spirits? What need is there to suppose that their spirits any more than their bodies subsist in themselves?

Or, conversely, suppose that we assume the existence of other minds whose "esse" does not consist in "percipi," that is, whose existence does not depend on their being known. If this is permissible, what right had Berkeley to assume that the existence of material things consists only in their being perceived? Is not the position adopted by Leibnitz and Lotze in closer accord with the facts—the position that the existence of so-called "inert" matter consists in "percipere"? And does not a thoroughgoing use of the analogical argument which was actually employed by Berkeley in the case of his fellow-men demand the admission that material things also exist independently of their being perceived? If so, then in a very real sense there is a substratum in which the qualities of an object inhere. And, further, this substratum, which is essentially spiritual, is proof against that pointed criticism urged by Berkeley against inert matter on the score of its inconceivability.

The truth is that although Berkeley practically

recognized two orders of existence, in the first of which the "esse" consists in "percipi," and in the second in "percipere," he necessarily left the relation between these two orders obscure and unintelligible. If it had been otherwise he would have seen that the admission of the second order, if pressed to its logical conclusion, would have overthrown his whole system. But notwithstanding all the obscurity in which he left the relation between these two orders, he certainly pointed out that our knowledge of other minds rests upon an argument from analogy. True, it is an open question whether the argument can be justified if we deny the independent existence of the material world. And certainly Berkeley does not explain how a world constantly dependent on mind is adequate to discharge the office of a reliable medium for intercourse between otherwise isolated finite spirits. But, however difficult it may be for him to square it with his general philosophical position, he does admit the existence of other minds which can only be known inferentially, and he is thereby saved from the absurdity of solipsism.

Now this inconsistency which mars Berkeley's philosophical system can be avoided in two different ways. In the first place, a thoroughgoing application of the solipsistic principle that the existence of all things other than the ego consists in "percipi" leads to consistency, but at a price which few, if any, are prepared to pay. A second way of avoiding the difficulty is that tried by Leibnitz. On that account I have taken the liberty of considering

him after Berkeley, although chronologically he should follow Locke.

According to Leibnitz even a material thing consists of monads—unextended, spiritual "atoms" of substance—which have unconscious perceptions and appetitions. Consciousness is not the essence of perception, but merely an additional determination belonging to certain kinds and degrees of perception. Thus, whereas the souls of other men "apperceive" and are self-conscious and exercise choice, the bare monads "perceive" and are moved by impulse without consciousness. The monads of which material things are composed, then, differ from the finite spirits inferentially assumed to exist by Berkeley in degree rather than in kind. There is indeed a gradation of beings from the self-conscious spirits to the unconscious monads, an uninterrupted scale of "perceiving" substances, each of which mirrors within itself from its own point of view and with varying degrees of clearness the infinity of existence. The number of grades in the series is infinite, but Leibnitz lays down certain main divisions which have a certain interest in relation to a study of ejection. He states that there can be distinguished souls or self-conscious monads, conscious monads which have only conscious perceptions and memories, and bare monads which have merely unconscious or confused conceptions. Now at first sight this division suggests that the philosophy of Leibnitz is essentially ejective in origin. The three classes of monads correspond to the principal varieties of representative activity which can be dis-

tinguished by the introspection of one's own mental life. And what Leibnitz seems to have done is to have ejected three elements of his own mental life, discovered by analysis, to explain the three groups of phenomena—men, the lower animals, and inanimate objects respectively. Indeed, there is evidence to show that this was explicitly done in the case of the latter, which were regarded as groups of bare monads. "For we experience in ourselves," he says, "a condition in which we remember nothing and have no distinguishable perception; as when we fall into a swoon, or when we are overcome with a profound, dreamless sleep. In this state the soul does not perceptibly differ from a bare monad; but as this state is not lasting, and the soul comes out of it, the soul is something more than a bare monad." [1]

Leibnitz therefore seems to regard it as legitimate to use data derived from introspection for determining the nature of the substance which underlies all real things. "What constitutes corporeal substance," he says, "must be something which corresponds to what is called Ego in us." This would suggest that whereas the solipsist avoids Berkeley's inconsistencies by denying all subjectivities except that of which he is immediately conscious, Leibnitz attains the same end by an all-round reading-in of appropriate degrees of subjectivity. At first sight it might therefore appear that his philosophical interpretation is entirely dependent on the use of ejection. But although the central conception of monads is undoubtedly

[1] *Monadology*, tr. Latta, § 20.

ejective in origin, it must be admitted that Leibnitz does not proceed to build up his system by an explicit use of analogy, as do Fechner, Clifford, and Romanes. To have done so would have necessitated the acceptance of a practical dualism inconsistent with his general idealistic outlook. Rather he proceeds dogmatically on the assumption that the only real existences are monads. And his *a priori* acceptance of the law of continuity makes him postulate a gradation of monads which represent the universe with all possible degrees of perfection. In his view his position is justified in so far as it makes possible a rational and coherent explanation of the universe. He is therefore not greatly concerned with the consideration of the method by means of which he arrived at his initial conception. It is perhaps this which accounts for the fact that he carries us no further in the direction of the development of an explicit doctrine of ejection.

Hume explicitly supports the view adopted by Berkeley, that our knowledge of other minds is mediated by our knowledge of self, though he does so apparently with the sole object of proving that animals reason. "We are conscious," he says, "that we ourselves, in adapting means to ends, are guided by reason and design, and that 'tis not ignorantly nor casually we perform those actions which tend to self-preservation, to the obtaining pleasure and avoiding pain. When therefore we see other creatures, in millions of instances, perform like actions, and direct them to like ends, all our principles of reason and probability carry us with an invincible

force to believe the existence of a like cause." His position is very cogently expressed in the one sentence: "'Tis from the resemblance of the external actions of animals to those we ourselves perform that we judge their internal likewise to resemble ours." [1]

It is obvious that there is here a definite recognition of the part played in our interpretation of other men and animals by the analogy which exists between them and ourselves. I know that in my own case there are certain internal feelings, thoughts, desires, which accompany or immediately precede certain external actions or expressions. And therefore when I see another perform like actions, by an implicit analogical argument, I infer the accompaniment of like feelings, thoughts, and desires.

Hume does not consider whether such an argument can be justified. He merely assumes its validity. And he makes practical use of the assumption. For example, in the *Dialogues concerning Natural Religion*, Cleanthes, who represents Hume in the disputation, makes use of such an analogical argument in support of his view of the nature of God, whom he regards as a mind or intelligence; and both of the opponents, Demea and Philo, use or at least assent to such an argument. In Part XII of the *Dialogues* there is even a recognition of the important truth that the differences as well as the similarities should be taken into account [2]—a truth which only later received adequate treatment in the hands of G. T. Fechner.

[1] Hume, *Works*, edited Green and Grose, 1874, vol. i. p. 469.

[2] Ibid. vol. ii. p. 457.

Fechner takes his stand with Descartes that the one incontrovertible fact of experience is the existence of one's own soul. The belief in the existence of other human souls rests on an analogical argument; and if it is permissible to use the argument in this special case, there is no reason why it should not also be applied to determine the inner nature of other beings provided that differences as well as resemblances are taken into account. Fechner then consciously proceeds by analogy, and he exhibits a remarkable power of making allowances for observed differences. Thus in *Nanna* he attributes souls to animals and even to plants, but they differ from human souls in a way appropriate to the differences in the bodies. Plant souls consist only of sensation and impulse bound to the present, animal souls have also presentiments and after-feeling, together with memory and representative association, while human souls have a still higher consciousness of the past and the future. Similarly in *Zend-Avesta* Fechner infers the existence of superhuman spirits—angels which ensoul the earth and the stars—and of God, the absolutely totalized consciousness of the whole cosmic system. But these naturally differ from human spirits. Thus, for example, the supposition of the Esquimaux or of the Kasia of Bengal—that the stars are actually men—is illegitimate, for no account has been taken of the obvious differences that exist between a star body and a man's body. The soul of a star is rather the collective consciousness of all its inhabitants, human and sub-human. And vaster orders of mind must go with vaster

orders of body. There is, then, a gradation in souls as there is in bodies. The souls of the inorganic world are always and entirely asleep; those of the organic kingdom are alternately asleep and awake; and God and His angels are eternally awake.

Fechner's whole system thus depends on the ejection of elements of his own conscious life to explain external phenomena, and it is important to this discussion in that it affords a good illustration of the way in which differences should be taken into account in any attempt to interpret the external world by analogy to self.

At first sight the views of Lotze and Fechner appear to be somewhat similar, but they also possess some striking contrasts. Like Fechner, Lotze starts from the position that our own inner states are absolutely certain and immediately evident to us, and he agrees that material existence on the one hand and our psychical existence on the other must be taken in conjunction with each other. He regards Fechner's conclusions in *Nanna* as irrefutable; but he rejects the idea that the celestial bodies have souls, for there is no evidence that they are anything more than arbitrary unities. Yet he carries the sphere of animated existence further down than Fechner. According to him all matter can be assumed to have a "double existence" —"outwardly in accordance with the well-known physical properties, inwardly stirred by mental activity." But he also thinks that "any attempt to conceive of matter as animated must of necessity be combined with another, viz. to prove that the

form in which we think we immediately apprehend matter, infinitely divisible extension, is an illusion, having as its foundation a multitude of indivisible beings, whose definition contains only super-sensible properties."[1] It is this which separates him from Fechner and shows him to be more nearly related to Leibnitz. Matter to him is "a system of unextended beings that, by their forces, fix one another's position in space, and by the resistance which they offer—as if to the intrusion of a stranger—to any attempt to make them change place, produce the phenomena of impenetrability and the continuous occupation of space."[2]

Lotze thus combines the partial truths of both Fechner and Leibnitz. With the former he is conscious of the method by means of which he draws his inferences concerning the animation of other beings than himself; and he realizes that the view that there is an inner mental life pervading all matter is only a hypothesis and ought not to be treated as an *a priori* dogma. And with the latter he sees that, though it may be permissible to infer consciousness in beings which have a natural unity, it may not be legitimate to suppose that arbitrarily chosen sections of matter have souls. He therefore rejects Fechner's indiscriminate panentheism and substitutes for it a modified Leibnitzian monadology.

J. S. Mill specifically treats of the evidence on which our belief in the existence of other sentient creatures is based in his *Examination of Sir*

[1] *Microcosmos*, tr. Hamilton and Jones, 1885, vol. i. p. 354.
[2] Ibid. p. 358.

William Hamilton's Philosophy, and he also finds it in an analogical argument. He does not think with Reid that in adopting the metaphysical theory that material objects are permanent "possibilities of sensation" and that therefore his own body is a "group of feelings," he is thereby robbed of the evidence for the existence of his fellows. In this he forestalls the criticism to be brought later against himself, and Clifford, and others, who attempt to combine an idealistic interpretation of the material world with a doctrine of ejection. Such criticisms will have to be dealt with later in examining Clifford's position. It is enough at this point to notice that Mill foresaw the criticism and dealt with it specifically. He stated the analogical argument without assuming that his own body or the bodies of his fellow-men have existence independent of mind.

"By what evidence," he asks, "do I know, or by what considerations am I led to believe, that there exist other sentient creatures; that the walking and speaking figures which I see and hear have sensations and thoughts, or in other words, possess minds? The most strenuous intuitionist does not include this among the things that I know by direct intuition. I conclude it from certain things, which my experience of my own states of feeling proves to me to be marks of it. These marks are of two kinds, antecedent and subsequent; the previous conditions requisite for feeling, and the effects or consequences of it. I conclude that other human beings have feelings like me, because, first,

they have bodies like me, which I know, in my own case, to be the antecedent condition of feelings; and because, secondly, they exhibit the acts, and other outward signs, which in my own case I know by experience to be caused by feelings. I am conscious in myself of a series of facts connected by a uniform sequence, of which the beginning is modifications of my body, the middle is feelings, the end is outward demeanour. In the case of other human beings I have the evidence of my senses for the first and last links of the series, but not for the intermediate link. I find, however, that the sequence between the first and last is as regular and constant in those other cases as it is in mine. In my own case I know that the first link produces the last through the intermediate link, and could not produce it without. Experience, therefore, obliges me to conclude that there must be an intermediate link; which must either be the same in others as in myself, or a different one: I must either believe them to be alive, or to be automatons: and by believing them to be alive, that is, by supposing the link to be of the same nature as in the case of which I have experience and which is in all other respects similar, I bring other human beings, as phenomena, under the same generalizations which I know by experience to be the true theory of my own existence." [1]

In this paragraph there seems to be a covert attempt to bolster up the analogical argument by

[1] *An Examination of Sir William Hamilton's Philosophy*, 1865, p. 208.

the law of causation. Mill supposes that he knows that his feelings and acts are causally related. And the law of causation therefore supports the conclusion that the acts of other men likewise arise out of certain feelings. But Mill is here making what is by no means a self-evident assumption, namely, that feelings do enter into the chain of causation under consideration. There are many who would deny this and would affirm that the physical series is complete in itself without the intermediate psychical term. But whether this be so or not, this at least is certain—that the only causality which can be *known* to exist between feelings and acts is causality in the sense of dynamic determination. Causality in the sense of invariable connexion cannot be postulated, for in most of the instances under examination, namely, our fellow-men, the sequence cannot be observed. And it is this second kind of causality which Mill supposes to exist when he brings the law of causation to the support of the analogical argument. What he has done is to pass imperceptibly from causality in the first sense to causality in the second. In this way the law of causation appears to become applicable and the conclusion to find additional support, when in reality the whole burden of the inference still rests on the analogical argument. All that Mill was entitled to assume was that there are two series—say A—B —C and A′— —C′, and that by analogy it may be inferred that there is an intermediate link, B′, in the second series. Justification for this inference must depend on the merits of the analogy and not

on any assumption that the members of the series are causally connected.

Huxley's contribution to the development of the problem under consideration only consists of a few lines; but in these few lines he brings out clearly the fact which was to serve Clifford later as the basis of his distinction between "objects" and "ejects"—the fact, namely, that by no manner of means can the presence or absence of consciousness be proved in anything but one's own brain, "though," he adds, "by analogy, we are justified in assuming its existence in other men." [1]

It is in an article entitled "Body and Mind" contributed to the *Fortnightly Review* that Clifford's earliest treatment of the doctrine of ejection is to be found. Although the word "eject" was not then coined, there is a clear recognition of the distinction between "objects," on the one hand, which are defined roughly as things which appear to us and which we can observe, and, on the other hand, facts in the consciousness of another man which are not objects or phenomena to us.[2]

The first use of the word "eject" occurs in a paper "On the Nature of Things-in-Themselves," read before the Metaphysical Society in 1874 and published in *Mind* in 1878. An "object" is there defined as a "group of my feelings, which persists as a group in a certain manner." An "eject," on the other hand, is an inferred existence which cannot

[1] *Collected Essays*, vol. i. *Methods and Results*, 1894, p. 219.

[2] *Fortnightly Review*, vol. xvi. pp. 726–7.

by any possibility become an object of my consciousness. "When I come to the conclusion," says Clifford, "that *you* are conscious, and that there are objects in your consciousness similar to those in mine, I am not inferring any actual or possible feelings of my own, but *your* feelings, which are not, and cannot by any possibility become, objects in my consciousness. The complicated processes of your body and the motions of your brain and nervous system, inferred from evidence of anatomical researches, are all inferred as things possibly visible to me. However remote the inference of physical science, the thing inferred is always a part of me, a possible set of changes in my consciousness bound up in the objective order with other known changes. But the inferred existence of your feelings, of objective groupings among them similar to those among my feelings, and of a subjective order in many respects analogous to my own—these inferred existences are in the very act of inference *thrown out* of my consciousness, recognized as outside of it, as *not* being a part of me. I propose, accordingly, to call these inferred existences *ejects*, things thrown out of my consciousness, to distinguish them from *objects*, things presented in my consciousness, phenomena." [1]

It was easy for Clifford to lead from this position to his theory of mind-stuff. If an ejective interpretation of other men is legitimate, should we not also ascribe consciousness in varying degrees in the series from man down to inorganic things? In this gradation of objects in order of decreasing complexity, is

[1] *Mind*, 1878, pp. 57–8.

there a point below which it is not permissible to infer facts of consciousness? Clifford emphatically answers "No." There is no break in the continuity. Even the inorganic molecule, though it does not possess consciousness, possesses "mind-stuff." In fact, it is of this mind-stuff that the molecule-in-itself consists.

The whole theory is obviously conditioned by the assumed legitimacy of the process of ejection, and one is naturally led to ask where Clifford found the ground for his unhesitating belief in that process. It would not be unfair to Clifford to say that on the whole he found it in the force of the analogical argument which lies implicit in every such ejection. He even went so far as to formulate a "rule of three" method of discovering the contents of other minds; the three known terms being, first, a change in my body; second, the accompanying inner experience; and third, a change in the body of some other man. The fourth term was the eject, reached by a process resembling mathematical proportion. But Fullerton has questioned whether Clifford, in so far as he interpreted idealistically the material universe and therefore the bodies of himself and his fellow-men, had any right to such an argument.[1] How, it is asked, can he pass from body to consciousness after absorbing the body into consciousness? Reference has already been made to this criticism, which applies equally to the position adopted by Berkeley, Mill, and even Huxley. Now, it is obvious that that analogical argument cannot

[1] Fullerton, *A System of Metaphysics*, 1904, Part IV, ch. 28.

be used unless the subjective and objective orders of experience have been distinguished; but this separation does not bind us to any specific metaphysical interpretation of that objective order. At the same time it must be frankly admitted that the use of the analogical argument is inconsistent with pure Idealism developed to its logical conclusion; for it leads to the recognition of two orders of existence, in the first of which the "esse" consists in "percipi," and in the second in "percipere."[1] Therefore, when Clifford recognized the existence of other human minds, he involuntarily became a dualist, by admitting an order of existence independent of his own perceptions and ideas. But this does not mean, as Fullerton imagines, that he ought to have begun by postulating a material objective order in opposition to, and independent of, his own and other minds.

Clifford must be criticized for not examining why the conclusion of this analogical argument is accepted as final. There is no possibility of direct verification. What, then, accounts for the certainty of the conclusion? Clifford gives no answer. Neither does he consider what degree of resemblance is necessary for the conclusion to be legitimate. Apparently he does not entirely rely on the analogical argument for his conclusion. Every now and again there is a suggestion that our belief in the existence of other men's consciousness is an ultimate belief which dominates every thought and action of our lives. "I judge by analogy," he says, "that it (your mind) exists, and

[1] *Vide* p. 36 in reference to Berkeley.

the instinct which leads me to come to that conclusion is the social instinct, as it has been formed in me by generations during which men have lived together, and they could not have lived together unless they had gone upon that supposition."[1]

In thus bringing to the support of the analogical argument the social instinct which necessitates belief in our fellow-men, Clifford seems to be confusing two aspects of the problem before him. There is, first, the psychological investigation into the way in which the belief arises and the way it is dependent on social instincts. And there is also the question of the logical grounds of this process of ejection. The tendency to interpret men in terms of self is no doubt instinctive, and in its initial stages is never conscious inference, but logical grounds for this process must be independent of any assumption of its instinctive nature. This inconsistency in Clifford's treatment of the problem is then only apparent, and is entirely due to his failure to differentiate the logical and psychological problems here involved side by side.

Clifford's invention of the word "eject," to which he assigned such a definite meaning, has certainly contributed to the clear statement of the problem under consideration; and his terminology has been adopted by later writers, notably by Romanes, Morselli, and Baldwin.

For example, in an article entitled "The World as an Eject" contributed to the *Contemporary Review*[2] Romanes used the word "eject" in Clifford's sense to signify any inferred subjectivity.

[1] *Fortnightly Review*, vol. xvi. p. 728. [2] July 1886.

In that article he was not concerned to examine or justify the process by which these ejects were reached. He assumed the validity of the process, and on that assumption attempted to justify an ejective interpretation of the world. According to his view, not only is the world made of mind-stuff, as Clifford had supposed, but there is an internal unity, an inner subjectivity corresponding to the macrocosm as a whole. The ejective existence ascribed to society served him as a stepping-stone to the more general ascription of such existence to the cosmos. Perhaps with less appreciation of the differences which should be taken into account in working the analogy between self and the cosmos, and certainly with nothing like the wealth of concrete illustration and poetic insight evidenced by the author of *Nanna* and *Zend-Avesta*, Romanes thus reached a conclusion similar to that previously adopted by G. T. Fechner with regard to the nature of the cosmos.

Although this is not the place for a consideration of those psychological problems so intimately interwoven with the doctrine of ejection, this historical study would be incomplete without some reference to the general consensus of opinion among psychologists concerning the inferential nature of our knowledge of other minds. Herbart, Beneke, Herbert Spencer, Sully, Bain, and Stout, among others, must undoubtedly be credited with a clear admission of the indirectness of the so-called "objective" method of Psychology—the method of interpreting the mind of another through its

external manifestations in the light of the investigator's knowledge of the facts of his own inner life and their external accompaniment.

As Sully puts it: "Since we only directly observe what is passing in our own individual mind, some amount of introspection is the first condition of all certain and accurate knowledge of mental states. To try to discover mental phenomena and their laws solely by watching the external signs and effects of others' thoughts, feelings, and volitions would plainly be absurd. For these external manifestations are in themselves as empty of meaning as words in an unknown tongue, and only receive their meaning by a reference to what we ourselves have thought and felt." [1]

Or Stout: "There is no such thing as direct observation of other minds; all that is immediately perceptible consists of sensible signs and tokens of inward events; and these sensible signs and tokens are interpretable only through knowledge obtained by introspection or retrospection.

"It is fundamentally impossible for any man to penetrate directly into the consciousness of his fellow-man, to say nothing of beings who are not men. For each of us the existence of minds distinct from our own is, from the standing-ground of logical and reflective consciousness, a matter of inference." [2]

Bain, too, notices that in the interpretation of other minds the psychologist is compelled to use

[1] Sully, *Outlines of Psychology*, 1884, p. 6.

[2] Stout, *Analytic Psychology*, 1902, vol. i. pp. 14–15.

the direct knowledge which he has of himself. In fact, it requires no great powers of imagination to read between the lines that Bain is not entirely easy in his own use of the method, for which apparently he did not succeed in finding logical justification. "In regard to the minds of others," he says, "the radical and insuperable difficulty of the situation is, that while the signs of feeling may be sufficiently distinct, we never have access to the thing signified. We must each use our single and solitary mind as a key to the whole human race; and not to it only, but to all superhuman and all infra-human minds. This must be pronounced a narrow basis of interpretation for such a vast range of individualities." [1]

Professor Enrico Morselli definitely makes use of the word "ejective" in this connexion and with the meaning assigned to it by Clifford. In his *Manuale di Semejotica delle Malattie Mentali* he notices the two possible methods of investigating mental maladies, the subjective and the objective; the latter, in his opinion, being more appropriately called ejective, "in so far as the consciousness of another is a different thing from our own consciousness, and in so far as states of the former are not capable of representation if they are not transformed by the aid of the perception of the senses into subjective states of the latter." [2]

From these quotations and numerous others which

[1] A. Bain, *The Emotions and the Will*, 1899, pp. 25–6.

[2] Morselli, *Manuale*, vol. ii., 1894, p. 79.

might be cited,[1] it is surely not unfair to conclude that there is general agreement among philosophers and psychologists concerning the indirectness of our knowledge of other minds. Yet there are men like Münsterberg and A. E. Taylor who definitely deny that that knowledge is in any way different from our knowledge of self. It is not more indirect; it does not find its justification in any argument from analogy. It will therefore be necessary to consider in some detail the doctrine of direct communion which claims to be a possible alternative to the doctrine of ejection, and for this purpose Taylor's statement of the case in his *Elements of Metaphysics* and in his article in the *Journal of Ethics* entitled "Mind and Nature" will be taken as representative.

Instead of finding the logical ground for our interpretation of our fellows in an analogical argument, Taylor inclines to the view that we come to know of the existence of feeling, purposive experience outside our own, "by the very same process by which we come to a clear consciousness of ourselves. . . . From the very fact of our existence in a society, every step in the execution of a purpose or the satisfaction of a want involves the adjustment of our own purposive acts to those of the other members of our social whole.

[1] E.g. Herbart, *Lehrbuch Einleitung*, § 1; Beneke, *Lehrbuch Einleitung*, § 1; Wundt, *Principles of Physiological Psychology*, tr. Titchener, Part I, ch. i. § 1; Hoffding, *Outlines of Psychology*, tr. M. Lowndes, 1891, p. 24; H. Spencer, *Principles of Psychology*, 1870, vol. i. § 56.

To realize your own ends, you have to take note of the partly coincident, partly conflicting ends of your social fellows, precisely as you have to take note of your own." [1]

Now, the fundamental fact of which we have to take account in Taylor's case is that he honestly considered that the argument from analogy was an insufficient basis for our belief in the existence and nature of our fellow-men. I shall deal with the specific criticisms advanced by Taylor in my consideration of the logical justification for ejection. It is sufficient at the present moment to notice that Taylor rejects the ejection theory because he believes that the argument from analogy is inconclusive. "I am convinced," he says, "that this popular and superficially plausible view is radically false, and that its logical consequence, the belief that the real existence of our fellows is less certain than our own, is a grave philosophical error." [2] But the logical consequence here referred to does not follow unless it be allowed that the analogical argument is insufficient. For, to say that my knowledge of other subjectivities is not immediate in the same sense as is my knowledge of self is not the same thing as to say that my knowledge of others is less certain than my knowledge of self. Immediacy is not synonymous with certainty. For example, in the syllogism—

All metals are elements.
Silver is a metal,
∴ Silver is an element—

[1] *Elements of Metaphysics*, 1903, pp. 205–6. [2] Ibid., p. 204.

the fact that the conclusion is derived from the premises does not make it any less certain than they, provided that the mode of reasoning be justifiable. But it does mean that the conclusion is logically posterior to the premises. Thus to say that my knowledge of you is mediated by my knowledge of myself is equivalent to saying that the former is logically posterior to the latter, but not necessarily that the former is less certain than the latter.

The consequence of which Taylor entertains such fear and which he terms a "grave philosophical error" does not follow unless the insufficiency of the analogical argument be admitted. Taylor's whole view depends on this admission, and it is easy to see to what it leads him. He does not want to believe that the existence of his fellows is less certain than his own, for that would mean the sacrifice of his general philosophical theory of pan-psychism. He has, then, a very natural bias to some view of his knowledge of his fellows which will enable him to retain his cherished theory. Having adopted the view that the analogical argument gave no reliable conclusion, what was more natural than that, in order to save his metaphysical theory, Taylor should formulate a doctrine in which his knowledge of other minds was regarded as immediate and not as a matter of inference?

The motive for formulating the doctrine is strong. Yet to the definite question: Do we know other minds immediately? Taylor would give but an indefinite reply. In one place we are said to learn of the existence of feeling, purposive experience

outside our own, "by the very same process by which we come to a clear consciousness of ourselves."[1] And similarly in another place it is stated that "there is a sense in which we may truly call the existence of mind in other men a directly presented fact of immediate experience." It is not made clear what that sense is, and it is certainly difficult to understand, for example, from what possible point of view the toothache that one man suffers may be regarded as a directly presented fact of immediate experience to an onlooker. But Taylor also speaks of the *conviction* which he has "that, over and above their existence as presentation-complexes, or contents of his perceptive states, the bodies of his fellows have the same kind of existence as directly apprehended in immediate feeling which he ascribes to his own."[2] Surely this is a recognition of the essential difference between his knowledge of his own subjective states, which are "directly apprehended in immediate feeling," and his knowledge of the inner life of another which is of the nature of a *conviction*. In yet another place he speaks of this latter knowledge as a "practical postulate." But more important than either of these admissions is a very curious statement concerning the dual existence of the body. After admitting that a man's body is both presented as an object to him and is also apprehended by immediate feeling, Taylor assumes that this furnishes a key not only to interpret the reality behind the bodies of his fellows—that would have

[1] *Metaphysics*, p. 205. [2] Pp. 203–4.

been an admission surprising enough—but a key to interpret the reality behind all phenomena. This is how he himself states the case: "For Metaphysics, it does not seem too much to say, this double existence of my own body, as a presented object about which I have knowledge in the same way as about everything else, and as an immediately felt unity, affords the key to the whole problem of the 'independent' existence of a reality beyond my own presentations." [1] Surely this is a general recognition of the validity of an ejective interpretation of the Universe. In addition to this general recognition, there is also at least one case in which Taylor makes specific use of ejection—namely, in his treatment of the problem of "the Unity of the Thing." He is here considering why it is that we come to regard a group of presentations as a thing —a unity, and this is what he says: "We project in imagination into the sensibly continuous inanimate mass the same kind of teleological unity which we find in our own mental life." [2]

Thus Taylor seems to say almost as much for the doctrine of ejection as he does against it. And curiously enough the indefiniteness of his position is traceable to the same source as that which accounted for the difficulties of the Ejectionist Clifford. In both cases there is a failure to separate the question of the justification for an ejective interpretation of others from the further question of the mode in which we arrived at that interpretation. The first is a logical problem, the second a psychological. To

[1] P. 203. [2] P. 126.

state that my knowledge of self is logically prior to my understanding of you does not imply that the former is psychologically prior to the latter in the sense that it must be complete and ready-made before any understanding of you is possible. To find the *logical* justification of ejection in an argument from analogy is not, as Taylor seems to imagine, necessarily inconsistent with recent studies of the part which imitation plays in the development of a child. It may be admitted that it is through imitation "that a child first comes to behave with conscious significance itself," but that fact, illuminating as it may prove for the psychological problem of the development of one's consciousness of oneself and others, gives no support to Taylor's onslaught against the analogical argument. To make this clear, consider a specific illustration. Suppose a child sees his nurse throw a ball and through imitation comes to do the same himself. He may throw the ball several times without conscious significance, that is, without reflecting on the experience of throwing. But his own subjective experience must be at least a step ahead of his interpretation of the nurse's act. The vital point to notice is that if he does not have the experience himself, he might watch the nurse throw the ball a million times without the faintest realization that the outward act is correlated with inner feeling. The recognition of the inner accompaniment in his own case *must* be prior to the assumption that the nurse has the internal feeling also, for the feelings of the nurse can never become empirical objects to the child. Of course, it would be absurd to say that

the child consciously reasons and logically infers the inner significance of the nurse's act. It is instinctively led to interpret the nurse's act as being like its own in inner accompaniment. The interpretation is then instinctive from the standpoint of psychology, but from the standpoint of logical and reflective thought its justification must be independent of any such assumption.

The confusion in Taylor's case is clearly seen in an illustration of which he makes use. He takes the case of our reading a letter and concluding that it is not the product of mere mechanism but has a significant meaning. "Why do we come to this conclusion?" he asks. And the answer is: Because of "our direct perception that the ink-marks have a significant meaning, express a recognizable purpose of the same kind as those which compose our own inner life." If by "direct perception" Taylor only means that we not consciously employ an analogical argument, no one would disagree with him. It could scarcely be maintained that any one arrives at the meaning of the words "Dear Sir" by considering what he would mean if he had written them, and then, on the strength of the analogy existing between himself and the writer, consciously drawing an inference as to their meaning. But surely a man's perception of the meaning of the letter is not direct in the same sense as is his perception of the ink-marks. Suppose the letter were written in Chinese hieroglyphics, of which he knew nothing. The direct perception of the ink-marks would remain, but the so-called *direct* perception of the meaning would

vanish. And why? Because the reader had no knowledge of the language. His interpretation of any letter is logically posterior to his individual experience of the connexion between the outward signs and the inner meaning. True, that experience has to be gained gradually by him as a member of society and is a social product, but that contention only affects the psychological question and not the logical problem.

Similarly with our interpretation of our fellow-men. Our tendency to eject undoubtedly owes its rise to a social instinct. It is true that our knowledge of self and our knowledge of others grow *pari passu*. And yet because it always remains a fact that the subjective experiences of others lie wholly and inevitably beyond our consciousness and are inaccessible to our experience, it is necessary to seek logical justification for our belief in them.

Before passing on to outline my own view with regard to this problem, reference ought to be made to the position adopted by C. A. Strong in *Why the Mind has a Body*. Although there are certain points of resemblance between the views of Strong and Taylor, Strong would never agree that our knowledge of other minds is immediate. To him another man's mind is a non-empirical existence in the strict sense of the term. My knowledge of your mind is "transcendent in exactly the sense in which the post-Kantians rule out such knowledge in principle." Further, he would acknowledge that analogical reasoning is implicitly involved in any assumption of other minds. And yet he believes that this

reasoning is so imperfect that, though it may suffice as a true guide for our interpretation of the *nature* of other minds, it is insufficient to prove their *existence.* "No argument," he says, "can possibly prove the existence of things extra-mental. The utmost it can do is to indicate their nature when their existence is already known from some other source. . . . Neither experience nor reason can fully account for the knowledge of other minds."[1]

It will be remembered that Locke believed that we reach the particular *nature* of other minds through analogy to self, and the knowledge of their existence through revelation. Strong's position is somewhat analogous, for he finds the justification for our specific interpretation of other minds in analogy and at the same time maintains that instinct furnishes a basis for the existence of those minds.

To claim with Strong that I have no *rational* ground for assuming that anything whatever exists outside my mind and that all such belief or knowledge is founded neither on reason nor experience but on instinct, seems an unfortunate way of stating the case; for it implies an inevitable opposition between instinct and rationality. It may be true that our belief in our fellow-men is instinctive, but at the same time this instinctive process of ejection by which we reach other mental existences may cohere with our general system of rational and reflective thought. It may be in line with our method of conscious reasoning, that is, it may be logically justifiable.

[1] Pp. 218, 219.

Let us now endeavour to analyse the complex problem before us. In the first stage of conscious life—that of immediate simple feeling—there is no separation of the self and the not-self, and until that separation occurs there can be no ejection. There may be "feeling with" our fellows, the boundary between the self and them being not yet drawn, but there can be no understanding of them. There is then at this stage the immediate feeling of self and *alter* together. And there is no logical problem involved here. The only justification possible is found in the immediacy of the feeling.

But gradually there occurs some separation of the self and the not-self, and now there are two problems involved side by side. There is first a psychological problem — how self-consciousness develops from the consciousness of the bodily self to reflective self-consciousness, and how at each point the knowledge of the not-self is mediated by the knowledge of the self. And there is, in the second place, a logical problem—the answer to the question: Can this instinctive process be logically justified? Does it cohere with our method of conscious reasoning?

The study of crowd phenomena seems to have revealed that we can return temporarily to the first stage and "feel with" others, and in the light of this, we have to acknowledge that Taylor's doctrine of immediacy and Strong's doctrine of instinct contain a half-truth. This inarticulate "feeling with" others is immediate, and in a sense

it is therefore true to say that we feel immediately *that* others are. But *what* they are we can never reach by this method. More than that, we cannot even know that they are "others," for the boundary between the self and the not-self has for the time being disappeared.

Yet this possibility of return to immediate "feeling with" others must be taken into account for a complete analysis of the psychological problems intimately connected with our knowledge of our fellows, for it serves to mark the limits of ejection. When the boundary between the self and the not-self has disappeared, there is no place for this process. But when there is a separation and the self interprets the not-self, there may occur ejective processes which will demand logical justification. And the only test which can be applied for this justification is that of their coherency with our system of reflective thought. In the next section, an attempt will be made to show that if that test is carefully and impartially applied, the use of ejection will not only be seen to be psychologically necessary, but it will also be vindicated by being in harmony with generally accepted principles of Logic.

CHAPTER II

THE LOGICAL JUSTIFICATION OF EJECTION

From the standing-ground of reflective thought, I shall endeavour to offer a justification for the process of ejection. I do not intend here to treat of ejection from a genetic point of view, but I am supposing that self-consciousness has somehow arisen; and on that supposition an attempt will be made to prove that the argument which lies implicit in our habitual interpretation of our fellow-men is logically legitimate.

In order to justify this argument it will be necessary to prove two theses; first, that our consciousness of self is unique, standing apart from our consciousness of all other objects, and secondly, that the argument dependent on this, by means of which we reach the minds of others, is justifiable by logical principles.

The Uniqueness of Self-Consciousness

In support of the first thesis I cannot here do more than outline what seems to be the true view of self-consciousness. By examining the contrasts

presented by historic views on this question it may be possible to select what is true in each and to gain thereby one which is more adequate. I do not intend to deal with specific and individual opinions, but rather to group together views which depend upon a common initial supposition.

There are two possible suppositions on which to found our view. First we may suppose that there is a separate "faculty" for self-consciousness—a kind of "inner sense"—by means of which we gain our knowledge of the operations of our own minds, just as we come to know external objects by the use of the external senses. Or, we may suppose that there is no special sense which has as its object the ego; but that self-consciousness underlies all objective experience, so that there is born in one synthetic act the knowledge of the object and of the subject who knows it.

Now, it is easy to see that the first or Lockian supposition is consistent with two views of the immediacy and directness of self-knowledge. In the first place it may lead to the Kantian position that our knowledge of self is phenomenalistic. It is modified by the form of the inner sense through which we apprehend it. Kant himself says: "We must admit with regard to the internal sense that by it we only are, or perceive ourselves, as we are internally affected by ourselves, in other words, that with regard to internal intuition we know our own self as a phenomenon only and not as it is by itself." [1] In this case, then, there is no peculiar immediacy or

[1] *Critique of Pure Reason*, tr. Max Müller, 1907, pp. 760–1.

directness, no uniqueness in self-knowledge. It is as indirect as, and less certain and more fleeting than, our knowledge of external things.

But the postulate that we gain our knowledge of self by a kind of inner sense may lead to the recognition of its uniqueness. Kant interpreted the inner sense by close analogy with the external senses, and he therefore supposed that in self-knowledge the self must experience quasi-sensations. But if we lay stress on the essential difference between the external senses and the internal, we arrive at a position analogous to that of Fries, Beneke, and Ueberweg. Through the internal sense we gain knowledge not of the phenomenal but of the real. Our states of mind are known to us unmodified by the introduction of any foreign element. At no point does our knowledge come upon any impenetrable barrier, for there is nothing in the object which has and retains the character of something "given" from outside. It follows, in the words of Ueberweg, that "Internal perception, or the immediate knowledge of mental acts and constructions, can apprehend its objects as they are in themselves with material truth."[1] Self-knowledge is therefore unique, since it alone is knowledge of things-in-themselves.

But surely this proof of the uniqueness of self-knowledge stands on an insecure foundation. It presupposes the by no means self-evident proposition that in external perception we never know an object with "material truth." The uniqueness of self-knowledge as compared with knowledge of external objects

[1] *System of Logic*, tr. Lindsay, 1871, § 40, p. 84.

consists in the supposition that a *tertiam quid* between the knower and the known exists in the one case but not in the other. Now, we may deny that there is a *tertiam quid* in the case of external perception. Or, since in the introspection of a mental state it is necessary to regard that state as an object, to "hold it over against" the subject as it were, we may support the Kantian view that there is as much of a *tertiam quid* in this case as there is in external perception. In either case, the perception of self is robbed of its *peculiar* immediacy. One's knowledge of self through introspection is as much or as little phenomenalistic as is one's knowledge of external objects.

Are we then compelled to give up our belief in the uniqueness of self-consciousness? That question cannot be definitely answered until we have examined the alternative view of self-knowledge. It has been held by many thinkers that to conceive of a mind as knowing itself through a kind of inner sense is misleading, to say the least of it. For such is the nature of consciousness, that in knowing an object the mind must know that it knows; in experiencing emotions and passions, it must know that it experiences them; in willing, it must know that it wills. As Cousin puts it, "To think without knowing that we think is as if we should not think." Self-consciousness is thus not a mode of our thinking activity having as its object the ego. It is rather contained in all the modes of our activity. This, for example, is the implication of Descartes' dictum, "Cogito, ergo sum." My experiencing of

an object not only gives me knowledge of the object but it also gives me certain knowledge that I, the subject of experience, exist. What Descartes did not see was that the certainty *that* I am throws no light upon the question as to *what* I am. Notwithstanding Descartes' dictum, it must be acknowledged that the notion of self is acquired by degrees. Yet it can scarcely be denied that there is a truth in this view of the immediacy of self-consciousness. And, as I interpret it, Professor Alexander's work[1] —particularly his "Sketch Plan of a Conational Psychology"—has the great merit of revealing exactly what that truth is. On that account alone it must rank as a very important contribution to modern philosophy. I will proceed, then, to consider it briefly in so far as it affects the question of the uniqueness of self-consciousness.

The key to Alexander's position is to be found in his distinction between "enjoyments" and "objects of contemplation." When I perceive an object there are two things present together: the mental act or process of perceiving, and the non-mental object perceived. Similarly, according to him, if I have an idea there is distinguishable a mental process which is "enjoyed," and an ideatum—a non-mental object—which is "contemplated." The enjoyments are what Locke called "ideas of reflection"; but he unfortunately made the mistake (in

[1] *Vide* S. Alexander: (1) *British Journal of Psychology*, December, 1911: "Foundations and Sketch Plan of a Conational Psychology"; (2) *Proceedings of the Arist. Soc.*: "Self as Subject and Person"; (3) Articles in *Mind*: 1912, pp. 1 and 305; 1913, pp. 14 and 161.

Alexander's view) of treating them as though they were another class of objects of contemplation like "ideas of sensation," whereas as a matter of fact they are conations, containing no cognitive element. Alexander would not go so far as to say that when I know, I must also know that I know, such being the very nature of consciousness. But he would say that when I know, I "enjoy" or "live through" the knowing at the same time that I contemplate the object known. Instead of self-consciousness being the immediate *knowledge* which the mind has of its own states, it is rather the immediate *enjoyments* which it has of its own processes or operations. These enjoyments form the subject-matter of Alexander's conational psychology, and these alone. He says quite definitely that we do not contemplate ourselves,[1] and that conations contain no cognitive element. And yet he implies that it is possible to describe and analyse enjoyments.[2] But how such description or analysis is possible without the contemplation of enjoyments is, to say the least of it, somewhat unintelligible. Immediate enjoyments, because of their very nature, are inarticulate and indistinguishable. If they can never become "objects" to us, the differences which may exist between them can never be recognized. No man can distinguish a thing of which he knows absolutely nothing from another of which he also knows nothing; and therefore it is meaningless to speak, as Alexander does, of the *contents* of a

[1] *British Journal of Psychology*, December, 1911, p. 261

[2] P. 241.

mental process which is merely enjoyed. The difficulty of his position becomes fully apparent when he tries to explain what he does mean by such an expression. He takes the supposed parallel case of a glass of water to illustrate the difference between the contents of the object perceived and the contents of the act of perceiving. By the "contents" of a glass of water we mean either the water contained in the glass or the material of which the glass is itself composed. Now the object experienced is to the act of experiencing as the water is to the glass. And the contents of the mental process are comparable to the composition, form, and size of the glass itself. But surely it is just this to which they are not comparable. The contents of the glass, even in this second sense, are contents of an object which we contemplate. There is no difficulty therefore in their specification and description. But the case is otherwise with regard to the supposed "contents" of a mental process; for, unless we can contemplate them, we can know nothing of them except possibly their hypothetical existence. And it is significant that when called upon to explain what he means by the "contents" of a mental process, Alexander is compelled to have recourse to analogy with the contents of a contemplated object—a proceeding which virtually amounts to a begging of the whole question. For unless it be admitted that enjoyments can be also contemplated—a supposition contrary to Alexander's initial position—the analogy entirely breaks down. Alexander is therefore left without any direct

knowledge of the "contents" of the pure enjoyments which are to form the subject-matter of his new psychology.

By what method, then, does he think that he obtains the data for his science? After stating definitely that "the distinctive characters of mental processes must be variations of the process itself, not characters of the object," [1] he eventually falls back upon the indirect method of correlation between the mental processes and the corresponding objects. Since we know the series of contemplated objects, this would undoubtedly be possible if we also knew one single member of the "enjoyment" series; but this we do not know. Now there can be no effective, no useful correlation between two series when absolutely nothing is known of one. For example, suppose that for the first time a man was watching a series of magic-lantern pictures being thrown upon a screen, and had never had any previous experience of the relation which exists between picture and slide. Suppose also that on this occasion he was effectively debarred from seeing the slides. Then thousands, even millions of pictures might pass before his view without his being a whit the wiser of the nature of the series of slides correlated with the known series of pictures. But if he examined one slide, marked its size and colour, and noticed how it was put into the lantern, and if he also saw its correlate upon the screen, then he would have data for effective correlation which would enable him to describe other slides which he

[1] Pp. 243–4.

had not directly examined. The necessary condition for effective correlation between two series is therefore that there should be knowledge of some members of each series. And since this condition is not fulfilled in the case of the two series which Alexander wishes to correlate, it follows that no effective use can be made of the differences known to exist in objects of contemplation to enable us to describe enjoyments.

Alexander is thus left with no data for his psychology. To be consistent he ought to relegate human psychology to those hypothetical angelic beings who may, in his view, be able to contemplate the mind of man. So peculiar is my own mind that though I can enjoy it, I can know nothing of it, because I do not contemplate it. Its very uniqueness robs it of all content, at least as far as I am concerned as knower.

What, then, is the true view of our consciousness of self? We have seen that if self-consciousness is the contemplation of the operations of our minds by a kind of inner sense, there is no element of uniqueness in it. It is as phenomenalistic and indirect as is our knowledge of external objects. On the other hand, if we hold with Alexander that self-consciousness is essentially of the nature of an enjoyment, we admit its uniqueness, but we have no body of known facts with regard to self. The truth seems to lie midway between these two views. The ground of the uniqueness of self-experience is undoubtedly to be found in the direct enjoyments which we have of mental processes. But we must also postulate that we have the power to contemplate some of these processes as well as to enjoy

them. In reflective self-consciousness there is a continual oscillation between enjoyment and contemplation of process, and it is this which effectively marks it off from consciousness of objects. True, the self which is enjoyed is larger than the self which is contemplated. There is no mental process compresent with any object, of which I am conscious or indeed of which I am subconscious, which does not form part of the enjoyed self, and on that account influence my actions and decisions. But it is only gradually, as increased power of reflexion is gained, that it becomes possible to contemplate some of these processes.

But a new problem now confronts us. We have been compelled to postulate that it is possible to pass from the mere enjoyment of a mental process to its contemplation. That such a transition occurs is indeed an undeniable fact of experience. Everyone knows, for example, what it is to pass from merely feeling anger to knowing that he feels it. And the question arises—How is this transition possible? If we could have agreed with Cousin that we cannot think without knowing that we think, there would have been no gulf to be bridged; but this we were unable to do. We have seen that it is true that we cannot think without enjoying or living through the thinking process, but this does not entail being explicitly aware of it. It therefore seems as though there is a gap between the mere enjoyment of a mental process and its contemplation. Can this gap then be filled by a doctrine of "implicit self-consciousness"?

Stout has supposed that even when a subject is wholly preoccupied with an external object he possesses implicit self-consciousness: that is, that even when the subjective processes do not occupy the focus of attention and are therefore not separately discerned, they may form undistinguished constituents of the total situation which is before the mind. "In general," he says, "explicit awareness of self seems to be pre-conditioned by implicit awareness." [1]

It is not difficult to see that this doctrine is in a line with, and indeed completes, the generally accepted hypothesis of sub-consciousness. It is usually supposed that the contents of a field of consciousness at any moment are to a large extent contents of a field of sub-consciousness and are not separately discerned, although they have their effect on the total impression received. Suppose, for example, that one is reading a list of the killed and wounded in a battle, and that towards the beginning there occurs the name of a man X whom one had known. The idea of X, his appearance, his wife, his history, is occupying the focus of consciousness, but the eye continues to move automatically down the list. Do the names that it passes leave no impression? It is difficult to suppose that this is the case, for the eye stops with unerring accuracy every time a regiment in which one is specially interested is mentioned. And further, if the name of any regiment is mentioned several times in succession, it reaches the focus of consciousness. There would therefore seem

[1] *Manual of Psychology*, 1913, p. 41.

to be some sub-conscious impression from every name, but it is only when the impression is multiplied many times, or is connected with peculiarly active "apperception masses" (to use the Herbartian term), that it has the power to force itself into explicit consciousness. These other names, and indeed even the spacing and the type, form part of the total impression received. Now, just as there is this field of objective sub-consciousness, so there are mental processes and states of which the subject is not explicitly aware which yet influence the total situation before his mind. That is, there is what might without misunderstanding be called a field of subjective sub-consciousness. Emotions, moods, states of mind may have their influence on the views of a subject when he is unconscious of their existence. Thus an angry man may have a distorted vision of an object (say a fellow-man) because of his anger; a light-hearted man may see everything through rose-coloured spectacles; and a man in the "blues" may see the dark side of everything. And the danger of inaccurate objective vision is increased by the very fact that these states of mind are not explicitly discerned. The psychological facts of the case therefore demand the admission of sub-self-consciousness or implicit self-consciousness.

And obviously this doctrine can be used to explain the passage from the enjoyment of mental states to their explicit discernment. If we suppose that we cannot enjoy a mental state without being implicitly aware of it, that is, without its influencing the total situation before the mind, the transition to its

explicit contemplation is not unintelligible. For all that is required for the implicit awareness to become explicit is a shifting of the focus of attention to a point previously in marginal consciousness. Given the implicit awareness of mental states, there is therefore nothing inconceivable in their occasional contemplation. The doctrine of implicit self-consciousness therefore enables us to offer some explanation of the transition from the mere existence of mental states to their cognition. It has all the advantages of Cousin's theory and at the same time does not violate experience by assuming that every existing mental state is explicitly discerned. But it makes one important assumption, namely, that there is nothing inconceivable in supposing that mental processes can be cognized either implicitly or explicitly. And it is therefore necessary to consider the main objection which has been raised in various forms against this assumption.

Let us first put the objection concretely. Suppose that the cognition of an object X brings into existence a subjective state A. Then it is argued that if A can become an object, its cognition must bring into existence a new act of apprehension B. And A would therefore have to be apprehended after it had been replaced by B, that is, after it had ceased to exist. In general, it is argued that since a subjective state exists only relatively to its object, it cannot be its own object, because in that case it would have to apprehend itself when it does not exist. But this argument is not really cogent. It does indeed show that a subjective state as such

must have an object other than itself. But it does not prove that if and when it has an object other than itself, it cannot also include some cognizance of itself. A finger-tip cannot rub itself unless it has something else to rub. But it can rub itself *against* something else. Similarly, we may be aware of subjective states in and through being aware of their objects. We may be implicitly aware of A, not by means of B, the coming into existence of which necessitates the disappearance of A, but in and through being aware of X. There is therefore no reason on the score of inconceivability to deny the evidence of ordinary experience that we have a reflective knowledge of our subjective states. The examination of the objection only shows that that knowledge is reflective in a very definite sense.

The self, then, is both enjoyed and contemplated. But some one may object to the expression that the *self* is enjoyed. It may be admitted that the present mental process is enjoyed, that, for example, the present pain is immediately experienced, but what of past mental processes? And in what sense can the self as distinguished from a present mental process be said to be enjoyed? Bergson has already supplied the answer to this question. In his *Essai sur les données immédiates de la conscience* he has shown that the separation of present processes from past states or of past processes from each other is essentially artificial, and is due to the influence of objective experience and to the incursion of space into pure consciousness. The relation of the enjoyment series (if for a moment it can be

called a series) is one of interpenetration, and therefore in a very real sense the whole continuity can be said to be enjoyed. And after the incursion of space, some members of the series (which is now a real series) become objects of contemplation. The self is therefore unique, being both enjoyed and contemplated, and it is thus clearly marked off from all other objects which are only contemplated. It therefore serves as a basis for the interpretation of one's fellows.

The Argument from Analogy

Consider next the second of the two theses which has to be proved. Given the uniqueness of self-consciousness, it still remains to be shown that our interpretation of our fellows as centres of experience like ourselves is legitimate. In every ejective interpretation of man or thing there lies implicit an inference from observed similarity of outward behaviour and bodily structure to similarity of inner experience, and in order to justify ejection from the standpoint of logic it will first be necessary to examine the nature of this inference.

In the historical study of the doctrine of ejection, reference has been made to A. E. Taylor's denial that the analogical argument is a sufficient basis for our belief in our fellows. Two main considerations seem to have led him to this conclusion. In the first place, he maintains that the data for the inference do not actually exist. "For what I perceive," he says, "is not, as the subjectivist assumes, three

terms—my own mental life, my own anatomical structure, and the anatomy of my neighbour, but two, my own mental life and my neighbour's anatomy. If I cannot be sure of the reality of my neighbour's experience until I have compared the anatomy and physiology of his organism with that of my own, I shall have to remain in doubt at least until science can devise a mechanism by which I can see my own nervous system. At present one of the terms on which the analogical argument is said to be based, namely, my own internal physical structure, has to be mostly taken on trust." [1]

If the data required are those mentioned by Taylor, the case is even worse than he supposes; for the ordinary man "takes on trust" not only his own anatomy but that of his neighbour also, and so in his case the three terms are reduced to one. But the difficulty with which we are confronted here is due to a misconception of the data on which the inference is based, or at least to an elimination of a great part of those data. In most cases an inference that another has an inner experience like that known in oneself depends more upon observed similarities of outward behaviour than upon any observed similarity of structure. And although every new observation of science which furnishes further data of similarity—either of structure or behaviour—ought to be welcomed, yet at the present time most of the facts on which the inference rests are undoubtedly observations of similarity of behaviour under similar conditions. If Taylor leaves these out

[1] *Elements of Metaphysics*, pp. 204–5.

of account either by accident or by sleight of hand, it is no wonder that he is able to ask with something of the manner of the smiling conjurer where the data for the inference are.

But this difficulty, even if it were of the magnitude that Taylor imagines, would be a difficulty of application rather than of principle. We are concerned here to justify the general process of ejection, and not any specific application of it. Taylor's second objection to the analogical argument is therefore far more serious. Even if the data which he demands existed, he would still urge that it is impossible to justify the conclusion that other men are centres of experience, and for this reason—that there can be only one case known of the coexistence of the inner experience and the bodily structure, namely, my own. "Obviously," he says, "if my own inner experience is the only one known to me originally, I have absolutely no means of judging whether the external resemblances between my own organism and yours afford reason for crediting you with an inner experience like my own or not. If the inference by analogy is to have any force whatever in a particular case, I must already know independently that likeness of outward form and likeness of inner experience go together."[1] The objection practically amounts to this—that the argument is insufficient because it is essentially analogical and because inductive verification must ever remain impossible. On the surface it might seem that Taylor's objection is valid, notwithstanding Bradley's

[1] P. 205.

counter-authority that the argument is "sufficiently good." But before being able to come to any decision with regard to the value of this argument it will be necessary to consider the nature of analogy in general, and to see in what respects (if any) this special analogical argument differs from the ordinary.

Mill has said that there is "no word in our tongue more loosely used" than analogy, and it is certainly difficult to extract from current systems of Inductive Logic any clear and consistent view of the nature and sphere of analogical arguments. In general there seem to be two opposing views. On the one hand, Kant and Hamilton regard as analogy any inference from the possession of some properties of a class to the possession of all. The difference between analogy and induction would therefore be to them practically that found in Jevons and Fowler. In induction there is great extension; in analogy, great intension. In the former case, we infer from a part of the extension of the subject to the whole; in the latter, from a part of the contents of the predicate to the whole predicate.

But Mill rejects this distinction as artificial, and he substitutes for it a difference in degree of evidence. He would use the word "analogy" to signify an argument founded on any sort of resemblance not amounting to a complete induction.

The opposition which exists between the two views is more apparent than real, and is due to the fact that the representatives of the first view are chiefly concerned to show the difference between

analogy and enumerative induction, and those of the second between analogy and eliminative induction. In order to do away with any confusion which may have arisen, it will be necessary to distinguish by illustrative examples the three closely related kinds of material inference—enumerative induction, analogy, and eliminative induction.

Suppose it is observed that A, B, C, D, etc., die, A, B, C, and D being grouped together as "men" from their general resemblance; and suppose that the conclusion is drawn that all men are mortal. This is a case of induction by simple enumeration. The resemblances between the particular cases are not definitely specified, and the logical force of the argument or the probability of the truth of the conclusion will depend upon the number of resembling instances observed.

Now, suppose that instead of general similarity there are definitely specified resemblances between A, B, C, and D.

Suppose A is observed to be tall, upright, to have a certain anatomical structure, high intelligence, bad temper, etc., and to be subject to organic growth and decay; and suppose B is observed to be short, upright, to have a slightly different anatomical structure from A, moderate intelligence, good temper, etc., and to be subject to organic growth and decay; and let C be tall, upright, having an abnormal anatomical structure, high intelligence, etc., and be subject to organic growth and decay; and so on.

Then if A and B, which agree with C in being

upright, rational, and in having organic bodies subject to growth and decay, are known to have died, it may be inferred that C will probably die. This is an analogical argument, and it should be noticed that there is specification of definite resemblances and differences.

But now suppose that the possession of an organic body could be shown to be causally related to mortality. The argument would no longer be analogical, but would be a case of eliminative induction. Here not only are the resemblances and differences specified, but their analysis is sufficiently thoroughgoing to disclose a causal connexion between the attribute possessed and the attribute inferred. The conclusion is therefore practically certain.

Analogy, then, differs from enumerative induction in that there is specification of the points of agreement and difference; in other words, it proceeds by analysis of content. But as soon as the analysis is sufficiently thoroughgoing to disclose an invariable causal connexion, the argument ceases to be analogical. And on the other hand, as Boyce Gibson says, "So soon as we can deepen the fact of difference into the fact of incompatibility, we seem almost as certainly to have gone beyond analogy as we have when we have deepened the fact of resemblance into a fact of causal connexion."[1]

Analogy, then, stands midway between enumerative and eliminative induction. And its conclusion is only probable, for it is an argument with a concrete content "without the assertion that this content is

[1] *The Problem of Logic*, 1908, p. 364.

absolutely dominant for the purpose of the argument." [1] Its formal defect is evident both in Lotze's representation of it in the third of the syllogistic figures and Bosanquet's representation in the second figure. Lotze supposes that a number of different marks occur in the same subject M. The premises are therefore M is P, M is S, M is T, M is U, etc. ; and the conclusion is drawn that M is a π, the sum of the marks P, S, T, U, etc., in its completeness constituting the nature of π.[2] The transition from P, S, T, U to π is not made explicit, and in this the treatment differs from that of Bosanquet, who makes this transition explicit but omits the premises M is P, M is S, etc. Thus, in the following representation, Bosanquet omits (*a*) and Lotze omits (*c*).

M is P
M is S
M is T . . . . . (*a*)
M is U

∴ M is PSTU . . . . . (*b*)

But N is PSTUZ (= π) . . . (*c*)
∴ M is PSTUZ (= π)

It is easy to see that in Bosanquet's representation (Fig. 2)—

M is PSTU . . . . . (*b*)

N is PSTUZ . . . . . (*c*)
∴ M is PSTUZ

[1] Bosanquet.

[2] Lotze, *Logic*, tr. Bosanquet, Bk. I, ch. iii. § 103.

there is both the defect of four terms and of an undistributed middle.

In Lotze's representation (Fig. 3) there is a formal defect in that the premises give only a part of the predicates necessary for a π, and from the presence of some, all are inferred.

On this account the function of an ordinary analogical argument is usually considered to be suggestive rather than demonstrative. According to Mill, the scientist should consider analogy as a "mere guide-post pointing out the direction in which more rigorous investigations should be prosecuted." "Coordinate with induction as a heuristic process stands analogy, which is also important only as a means of framing hypotheses."[1] And the history of science is replete with illustrations of the effectiveness of analogy as an aid to discovery; for, by following up hints from analogy, the investigator often arrives at the truth by a short cut, instead of proceeding by examining every possible explanation of any phenomenon. But in scientific investigations the findings of analogy are put to the test. For example, suppose a chemist finds a new element and wishes to investigate its properties. From a few observations he is perhaps led to think that the new element has properties analogous to some other known elements. And the analogy suggests to him his method of procedure. Otherwise he would have no simple method of attack at his disposal, but would have to try whether the element reacted with every conceivable substance under every con-

[1] Sigwart.

ceivable condition. And most of these experiments conducted blindly without any guiding principle would give negative results. In reality the analogies perceived by him continually guide him. But at every point the conclusion of the analogical inference is tested by experiment and directly verified. In scientific inquiries this verification is usually possible, but the question arises: Are there not some inquiries which only admit of the use of analogy and where there is no possibility of direct verification? And in such a case, what is the value of the hypothesis which can be analogically framed?

Consider first the case of the comparatively pure analogical argument that there are probably inhabitants in Mars because there are inhabitants on the Earth. Mars is like the Earth in that it is subject to the law of gravitation, it revolves round the sun, it has a fairly equable and temperate climate, and it possesses a surrounding atmosphere. It rotates on its axis in about the same time as the Earth, the time in the case of Mars being usually given as 24 hours 37 minutes $22\frac{3}{4}$ seconds. Thus one day in Mars is about equal to one day on the Earth. Judging from the drawings by many observers of the telescopic appearance of Mars, it is probable that there are divisions of land and water on that planet. For example, the print of Mr. C. E. Burton's views of Mars in Sir Robert Ball's *Story of the Heavens* plainly shows marks which may correspond to continents and oceans.[1] At the poles, too, there are white regions which undergo periodic

[1] Revised ed. 1891, p. 187.

changes and which suggest the presence of snow and ice, and therefore water, in Mars. But there are also numerous points of difference between the Earth and Mars. They differ in size, Mars having a diameter of about 4,200 miles—little more than half that of the Earth—and this difference in size brings with it a resulting difference in the intensity of gravitation on the surface of the planets. Then Mars has two satellites, whereas the Earth has only one. From an attempt to "weigh" these resemblances and differences we may perhaps conclude that Mars is inhabited, but there is nothing inevitable about this conclusion at present. With the progress of science it is possible that either the dwellers on the Earth may visit Mars, or that the Martians (if such exist) may visit the Earth, or that there may be some kind of communication between the two planets. Direct verification or refutation is therefore a future possibility: but until it becomes an actuality the conclusion is at best only probable. True, its probability increases with the discovery of further resemblances, and particularly of resemblances which can be regarded as "important" for the argument in question. But it would never amount to a high degree of probability unless there were discovered in Mars constructions which presuppose intelligence of the human order. For example, if it were absolutely certain that there were artificially constructed canals in Mars, there could be little doubt with regard to the existence of Martians either to-day or at some period in the past. Now, the argument from the presence of

artificial canals to the presence of inhabitants is also an argument from analogy. But it seems to have a different degree of force. Given the absolute certainty of the presence of canals or railways or other constructions, and the conclusion that there are, or have been, inhabitants is practically inevitable—notwithstanding the absence of direct verification. Is this, then, a case of ordinary analogy?

It might perhaps be urged that intelligent beings and their constructions are *causally* related, and that we are therefore not arguing by mere analogy but by eliminative induction. This would account for the apparent difference in degree of evidence: but, as we have seen in the criticism of Mill's position,[1] causality in such cases is causality in the sense of dynamic determination and not in the sense of invariable connexion. The only intelligence known directly by me to be associated with constructions is my own. Everybody else's has to be inferred from his constructions or from other outward signs and tokens. Since only one instance of the association is known and no negative instance is possible, Mill's inductive methods are inapplicable, and intelligence and constructions can never be shown to be causally related in the sense of being "necessarily connected." The argument is therefore not a case of eliminative induction but of analogy. And the same is true of the inferences which lie implicit in all ejective processes. Every argument from observed similarity in the outward

[1] P. 47.

behaviour of myself and another to similarity in inner experience is essentially analogical, but it has this peculiarity as contrasted with the analogical arguments which have been previously considered —that no direct verification or refutation of the conclusion is possible. The mind of another can never be an empirical fact to me; neither, indeed, can the absence of mind.

The case might therefore be represented symbolically as follows: In the comparison between myself and another man, let the common properties, that is, our bodies and outward acts of behaviour, be represented by QRS. In my own case there is also a unique element—self-consciousness, my mind, or my inner life. Let this be represented by P. There is then one instance known of the coexistence of P with QRS; but according to the nature of the case it is impossible that there shall ever be known any other PQRS. There are instances of QRS, but of such a nature that P can never be *proved* either present or absent. Suppose, then, it is inferred by analogy that P is present. It is obvious that experimental verification is impossible, but so also is refutation. The difference between such a case and that of the argument from the analogy which exists between Mars and the Earth is surely apparent. In drawing the conclusion that there are (or are not) inhabitants in Mars, there must always be present the disquieting fact that refutation of that conclusion may be sprung upon us at any moment. But here is a case where refutation is absolutely impossible, and the question therefore arises: Does not the one

example of the coexistence for this very reason count for infinitely more than it otherwise would? Suppose we attempt to apply to this case the principle generally used in estimating the degree of probability of the conclusion of an enumerative induction. According to Mill, we can apply this principle if every possible case has been considered and we have "possessed ourselves of the utmost attainable amount of positive knowledge." In the peculiar case under examination, the hypothesis framed analogically, that P coexists with QRS, is in a sense inevitable. For, *if all possible instances have been examined*, the ratio of the number of known occurrences (of P and QRS) to the number of known exceptions approaches infinity as we approach to certainty. Now in this case, *after the consideration of all possible instances*, it is found that—

The number of instances of the occurrence of P and QRS = 1
The number of instances of known exceptions = 0

$$\therefore \frac{\text{number of occurrences}}{\text{number of exceptions}} = \frac{1}{0}$$

$= \infty$ (representing certainty).

Here, then, we have an analogical argument which is a peculiar limiting case of enumerative induction. The fact that the ratio of the number of known occurrences of P and QRS to the number of known exceptions works out to be infinity must be interpreted to mean that the one positive instance counts for more *because there can be no negative instance.* Suppose that it be admitted that analogy can never do more than give us a working hypothesis. In this

special case there is a sense in which the hypothesis that P is present in the second group of instances is inevitable. In other words, there is no rival hypothesis. If any conclusion is adopted at all with regard to P, it must be the one which is in line with the positive instance. For to infer that P does not exist would be not only to ignore but to go directly contrary to *all* the positive evidence in the inquiry. The hypothesis that can be analogically framed is therefore inevitable, and should be contrasted for example with such a hypothesis as that of the atomic constitution of matter. The latter is justified in that it correlates and explains a large number of facts, but there is no positive evidence which would rule out from consideration the opposite hypothesis of the absolute continuity of matter. If there were one instance where the atoms were accessible to direct observation, the case would be comparable to that under consideration, for there would then be independent evidence of the reality of the *vera causa* postulated to explain the facts, just as there is direct knowledge in the positive instance of the existence of one mind. The ejection hypothesis is therefore inevitable in a sense in which the atomic hypothesis is not inevitable. But this does not mean that it must be accepted at the beginning in an absolutely irrevocable form, but only that the direction in which an explanation is to be sought is already fixed. We must therefore substitute the idea of confirming and moulding the hypothesis for the idea of gauging its probability. As we have seen, further investigation will never reveal the

presence or absence of P, and therefore never directly verify or refute the hypothesis. But it may reveal hitherto unobserved similarities or differences between the positive instance and the problematic term in the analogy, and it may therefore confirm or modify the original hypothesis.

In the case of our fellow-men there is continual confirmation of the original hypothesis as the data become more complete and are more carefully scrutinized. The hypothesis that they are centres of experience certainly works. As new facts arise they continually confirm the old analogical presumptions. The longer we live with our fellow-men the more efficient as an interpretation does the hypothesis which was framed analogically appear to be, and the more facts does it seem to co-ordinate. In conclusion, then, the belief that our fellows are centres of experience is in the first place a hypothesis to which we are inevitably driven by the analogical argument; and in the second place it is a hypothesis which receives constant and repeated confirmation in all our dealings with our fellows. It is then logically justified not only because it stands without rivals, but also because its use renders coherent the whole of our intersubjective experience, which would otherwise be a chaotic mass of unorganizable data.

But in regard to the rest of our environment the case is somewhat different. No one would deny that there has been a continuous development from the indiscriminate ejection of primitive man to the discriminate ejection which the adult civilized man

uses to-day. For all along the line, instead of confirmation there has been modification of the first interpretation. As Ward puts it :—

A "primitive imputation of personality, though it facilitates a first understanding, soon proves itself faulty and begets the contradictions which have been one chief motive to philosophy. . . . Such instructive analogies have, like other analogies, to be confirmed, refuted, or modified by further knowledge, i.e. by the very insight into things which these analogies have themselves made possible." [1]

In the symbolic example previously cited no complications were supposed to exist. In the instances of QRS there were no observable points of difference. They were all QRS—nothing more and nothing less—except the one instance of PQRS. But the case is not so simple in actual practice. Even the individual differences in outward behaviour which are observable between myself and another man, and which are comparatively slight, ought to have some influence on my interpretation of that man. And in the case of the rest of my environment the differences are far greater. Although the condition may be the same with regard to the impossibility of "proving" P either present or absent in all except one instance, there will be many differences discoverable by the careful comparison of the problematic term and the positive instance in the analogy. And until the data of comparison are complete and we know how to work the analogy correctly, the hypothesis will be continually subject to modification.

[1] Article on Psychology, *British Encyclopædia*, 9th ed. p. 81.

What remains to be done is not to attempt the impossible task of finding direct verification, but to rise to a full appreciation of differences as well as resemblances, allowing them to have their full weight of influence on the nature of the conclusion. In other words, the hypothesis must be moulded. Its inevitability must not be interpreted to mean that it has a definite and irrevocable form.

For example, let us suppose that we have one instance of PQRST, and others of QRS in which, as before, P can never be directly known to be present or absent, but in which T is known to be absent. The first impulse of the human mind when confronted with such a case is to infer that P is present in the second instance. The inevitability of the analogical presumption is interpreted to mean that the differences can be ignored and the presence of P pure and unadulterated can be inferred. But this is due to a misconception. Every difference must be taken into account. There must be an analysis of P, and the influence on it of the removal of T must be estimated. Let P represent P as modified by the removal of T. Then the only hypothesis that can be justified is that P_T, and not P unmodified, is present with QRS. But this presupposes not only a careful examination of the instances to see in what points they agree and differ, but also a knowledge of the nature and elements of P as related to T, which knowledge can only be gradually gained by the provisional use and subsequent modification of the initial hypothesis.

The change in man's interpretation of his environ-

ment seems to be a psychological process or group of processes which corresponds to the logical moulding of the analogical hypothesis. Primitive interpretations of animals and natural objects are now judged over-anthropomorphic because the race has now learned, or is learning, to take account of differences. In the early stages of the history of mankind the crude self as a whole was ejected to explain animals, plants, and even inanimate objects. But now the use of ejection is more discriminate. Differences are taken into account, and the application of our knowledge of self to explain our environment implies an analysis of the empirical self into its elements. Thus to-day we have passed beyond the first instinctive imputation of personality to explain natural objects, and are learning to discriminate between nearer and more remote analogies and to apply this discrimination to phenomena. We distinguish groups of phenomena from other groups ; men, animals, and plants from the inanimate. By abstracting some elements of our mental life —our organic sensations, and the lower part of our mental life due to sensations, movements, and reflex actions, etc.—we gain some insight into animal life. By abstracting our organic sensations we may perhaps gain some insight into vegetable life. And for the interpretation of inorganic nature the analysis must be carried still further. But it does not follow that the ejective element should ever be entirely eliminated. Indeed, the logical situation would suggest that, however great may be the differences between our outward structure and behaviour and

that of inanimate objects, as long as there is any resemblance there ought to be a corresponding ejective factor in our interpretation of those objects. It is difficult to see that we have any more right to ignore the resemblance than had the savage to ignore the differences—unless it be for a clearly defined purpose. The use of real categories furnished by the analysis of the empirical self would therefore seem to be logically justifiable in the ultimate interpretation of man's physical environment. And this discussion suggests that if science eliminates all ejective processes and deals solely with objective changes in relation to objective changes, it may have to relinquish its claim to be disinterested. In other words, if its interpretation results from a conscious omission of points of resemblance, it may have to be acknowledged on that account to be insufficient to give the full meaning of the universe.

PART II

EJECTION FROM THE STANDPOINT OF PSYCHOLOGY

PART II

EJECTION FROM THE STANDPOINT OF PSYCHOLOGY

INTRODUCTION

EJECTION AND PROJECTION; EJECTION, INTROJECTION, AND INTROLATION

In the first part of this study an attempt has been made to show that much of the misunderstanding of the doctrine of ejection has arisen owing to the failure of both its supporters and opponents to separate the logical and psychological problems involved side by side. For the sake of clearness I have tried to effect the separation that seemed desirable, and have so far been concerned with ejection from the standpoint of general philosophy.

In this second part of the study, ejection will be considered from the standpoint of psychology; and it will first be necessary to distinguish it from some other psychological processes with which it is liable to be confused.

Ejection and Projection

At the outset it should be noticed that the term "projection" is used by some psychologists—notably

by Sully and Stout—to denote the process which has been described here as ejection. The latter term has been adopted because the word "projection" is somewhat loosely used in psychology at the present time. For example, it is sometimes used in a narrower sense to signify "the spatial objectivation of objects in sense-perception."[1] And it has been given a somewhat different connotation by Baldwin in his very valuable books, *Mental Development in the Child and the Race* and *Social and Ethical Interpretations*. There he distinguishes projection from ejection in that he makes the former a stage in the genetic construction of objects antecedent to the conscious antithesis between subject and object, and the latter a state subsequent to the realization of that opposition. Throughout this study "ejection" has been used to signify any process in which a man uses his own subjective experiences to interpret other persons and things, and with this meaning it is obvious that ejection can only occur after there has been a separation of the self from the not-self.

Ejection and Introjection

What, then, is the relation between ejection as thus defined and the process of introjection which Avenarius declared to be fallacious? Suppose it be granted for the moment that Avenarius has successfully maintained his thesis that introjection leads to a view of the subject's relation to reality which will

[1] *Dict. of Phil.*, edited by Baldwin.

not stand the test of reflective criticism. There remains the question whether the relation between ejection and introjection is of such a nature that both must of necessity survive or perish together.

From Baldwin's brief treatment of this relation it would seem that he would draw no distinction between ejection and introjection.[1] But a careful examination of the exact connotation of the two terms and of the implications of the two corresponding processes shows that they are not exactly synonymous. This is suggested by the fact that Avenarius, the arch-critic of the introjectionist view of experience, himself proceeds to found his empirio-critical position on a presupposition which is an implicit recognition of ejection. "I, with all my thoughts and feelings," he says, "found myself in the midst of an environment. This environment was composed of manifold parts which stood to each other in manifold relations of dependence. To the environment belonged also fellow-creatures with their manifold statements; and what they said also stood for the most part in a relation of dependence to the environment. For the rest, my fellow-creatures spoke and acted as I did; they answered my questions as I answered theirs; they sought the various parts of the environment or avoided them, changed them or sought to maintain them unchanged; and that which they did or left undone they described with words, and gave reasons and purposes for deed and omission. All this they did even as I myself; hence I thought not but what my fellow-creatures were

[1] *Mental Development*, 1906, pp. 322–3.

beings such as I myself and that I was a being such as they." [1]

This statement, and the presence in his system of what he terms E values—values accepted as the contents of the statements of other human individuals—prove that Avenarius had no objection to the supposition that one's fellow-men "experience" their environment even as one does oneself. Judging from their statements and the various relations into which they enter with the parts of the environment, that assumption is natural and legitimate. That is, Avenarius did not object to the ejective process as such, nor to the belief that all men have "experience" of their environment. But he did think that the introjectionist view of the nature of that experience was indefensible. According to that view, our experience of objects is within us in the form of sensations, perceptions, and other mental states, and is merely "representative" of the reality beyond us to which it refers. Thus, when a man sees a tree, what he experiences is not the tree but his perception of it. In this way an insuperable barrier is raised between him and the real tree. He can never reach out to the tree-in-itself, for his perception always blocks the way and prevents his entering into direct relation with it. His states of mind thus stand as an immovable *tertium quid* between him and reality. It was against such a view—a view usually but not necessarily implied in the use of ejection—that Avenarius levelled his criticisms.

The exact relation which exists between ejection

[1] *Der Menschliche Welt-begriff*, 1891, pp. 4–5.

and introjection will be most readily understood by the use of an illustration.

From the standing-ground of reflective thought, let us examine the case where I and a man M are looking at any object—say, a book. I know that I "experience" the book and I also see M in objective relations with it. I may see him turn his body or direct his eyes towards the book. I may see him grasp it, open it, repeatedly direct his eyes from left to right as if he were seeing successive points in horizontal lines. From the peculiar objective relations which I observe between him and the book I am led to believe that he "experiences" it. This is a case of ejection, and there is as yet no necessary implication that the experience either of myself or M consists of perceptions representative of the real.

But because the book appears to me to be outside M, I may proceed to infer that M's experience of it is in the form of perceptions or internal states of his mind; that is, I may "introject" his experience into his body. This is a case of introjection in which M's experience of the book is regarded as being indirect and mediated by a representation which is merely like the book. The next stage follows quite naturally. The interpretation of M's experience as being "representative" of the real is extended to embrace my experience also, and thus there arises that impassable barrier between myself and reality to which reference has already been made.

Now it must be acknowledged that if I come to

regard my experience as "representative," that fact will henceforth modify my ejective interpretations of the reactions of my fellows. But the vital point to notice is that if reflective criticism compels me to abandon the introjectionist view of experience, that in itself need not lead to the abandonment of the process of ejection. For by means of the latter I suppose not that other men have any specific kind of experience, but rather that they have that kind of experience that I think I have. To prove, then, that introjection is fallacious is not the same thing as to prove that ejection, which may or may not involve introjection, is indefensible.

From the illustration which has just been considered it will be seen that ejection and the second stage in introjection stand to one another in a kind of converse relationship. The former is the interpreting of certain objective relations in the light of that thought to exist between myself and my environment, while the latter is the interpreting of my experience in the light of certain objective relations which appear to exist between other men and objects.

If it had been possible I should have preferred to reserve the term "introjection" for the process which is the strict converse of ejection. But under the circumstances such a use would only add to the already existing confusion. So I will term the strict converse of ejection "*introlation.*"

Ejection is the process of interpreting the objective in terms of the subjective, the "throwing out" into the objective world what is only found within the self. Introlation, on the other hand, is the interpre-

ting of the subjective in terms of the objective, the "bringing within" what is found in the objective world. The second stage of Avenarius' introjection is therefore a special case of introlation, in which the relations thought to exist between another man and a thing—an eject and an object—influence the interpretation of subjective experiences. But relations which appear to exist between an object and an object may also affect an interpretation. Indeed, according to Bergson, it is due to the influence of objective experience, to the reading in of relations which pertain to objects, that conscious life has ever appeared in its second aspect. In his view the relation of mental processes to one another in inmost life is one of interpenetration. The stream of consciousness is one of qualitative differences. Its events endure by changing; they are not separate from, but they melt into each other. Their succession in "duration" has nothing in common with juxtaposition in space. But owing to the influence of objective experience, the ego comes to be perceived through the medium of space. It ceases to be thought of as a living continuity and becomes a succession of juxtaposed separate states. Relations thought to exist between external objects are *introlated* into pure consciousness. This is how Bergson himself describes the change. "Our ego comes in contact with the external world at its surface; our successive sensations, although melting into one another, retain something of the reciprocal externality which belongs to their objective causes; and this is why our superficial psychic life appears without any great effort to

be unfolding in a homogeneous medium. But the symbolical character of this representation becomes more and more striking as we penetrate further into the depths of consciousness; the inner self, that which feels and is impassioned, that which weighs and decides, is a force whose states and changes interpenetrate and suffer a deep alteration as soon as we separate them from one another to set them out in space. But since this deeper self forms one and the same person with the superficial self, of necessity they appear to endure in the same way. And since the repeated representation of an identical objective phenomenon which recurs, cuts up our superficial psychic life into parts external to one another, the moments which are thus determined in turn determine distinct segments in the dynamic and undivided progress of our more personal conscious states. Thus the reciprocal externality which the juxtaposition of material objects in space entails reverberates and spreads even into the depths of consciousness; little by little, our sensations are separated from one another like the external causes which gave rise to them, and our feelings and ideas are distinguished like the sensations which occur simultaneously." [1]

Bergson thus supposes that the relation of mutual exclusiveness which exists between things in the external world influences the interpretation of subjective experiences. There is, then, a process which is the converse of ejection and which for the sake of clearness I have termed introlation. And in con-

[1] *Essai sur les données immédiates de la conscience*, pp. 95–6.

clusion it should be noticed that, although ejection usually involves introlation, it is not necessary that this should be so. If reflective criticism makes the representative view of subjective experience untenable, or if Bergsonian criticism proves that the self is distorted by the incursion of space within it, ejection is still possible. The only difference will be that the self ejected will be a purified and less imperfectly conceived self.

Having distinguished ejection from projection, introjection, and introlation, it will next be necessary to consider certain psychological questions connected with its origin and development. Here the treatment falls naturally into two divisions. The first section will be concerned with the development of ejective processes in the history of an individual, the second with the similar development in the history of the race.

SECTION I

THE DEVELOPMENT OF EJECTIVE PROCESSES

AN ONTOGENETIC STUDY

CHAPTER I

EJECTION AND THE DEVELOPMENT OF SELF-KNOWLEDGE

In connexion with Taylor's criticism of ejection it was pointed out that much misunderstanding of the doctrine had arisen owing to the failure of its critics and supporters to separate logical and psychological problems involved side by side. And there is no question in which this failure in discrimination is so likely to occur as that with which we are now concerned, namely, the order and nature of the development of our knowledge of ourselves and of our fellows. Clearly, our knowledge of ourselves is *logically* prior to our interpretation of our fellows in terms of that knowledge. On that account it was legitimate for us to seek logical justification for the process of ejection on the assumption that our knowledge of ourselves had somehow arisen. But this must not be misunderstood to mean that our developed consciousness of ourselves is psychologi-

cally prior to any understanding of our fellows. To imagine that any one attains to developed self-consciousness in splendid isolation and then at a certain definite point makes a sudden début into social life and the understanding of his fellows is manifestly absurd.

Man was gregarious before he was self-conscious, and it is to the so-called social "instincts"—the parental instinct and the instinct of gregariousness—that we must look for the origin of both self-consciousness and the ejective interpretation of others. The child is from the first one among others. There is a constant interplay between him and other personalities, with the result that the conception of self which he reaches in adult life is essentially a social product, its development having been effected by continual interaction with others.

There is very little direct evidence to show what kind of self-consciousness, if any, could be developed in a child brought up without contact with his fellows, supposing that life could be maintained under such artificial conditions. The examples usually cited in this connexion seem to be mainly mythical, and in a case which seems to bear the marks of authenticity, such as that of Kaspar Hauser, who was supposed to have lived alone for the first fifteen or sixteen years of his life, the observations made seem scarcely scientific enough to justify any certain generalizations. But such evidence as exists in this case agrees with what might have been expected on *a priori* grounds. The conations, pleasures, and pains experienced, and the thread of continuity supplied

by the mass of organic sensations, would be sufficient to give rise to a consciousness of the bodily self. Experiences of contact with solid objects would result in some rudimentary conception of a self, in opposition to which the resisting objects were "others." But even if we suppose an inherited tendency towards introspection, it is difficult to see how, unaided by contact with others and particularly by communication through language, reflective self-consciousness could ever appear in anything but a rudimentary form. The developed conception of self seems to imply constant reference to others and to society in general. It is, in fact, in the words of McDougall, "not merely a conception of self, but always of one's self in relation to other selves."[1] Sully, Stout, Baldwin, Royce, and Ward, and others, have likewise realized this truth, which is of the utmost importance for genetic psychology, that our knowledge of self and others grows *pari passu*, each reacting upon the other. The popular prejudice against the bookworm, so often evidenced by men of the world, has also probably arisen from a faint realization of the working of this general law of development. If, for the full attainment of personality, one must have contact with one's fellows and learn to understand their ways, then it is not unlikely that he who becomes absorbed in the contemplation of abstract truth may have to pay for his neglect of the "proper study of mankind"; and, with something like poetic justice, the penalty will consist in the harsh judgment by his fellows that he has a feeble, uninteresting personality.

[1] *Social Psychology*, 1912, p. 180.

The examination of such a case as that of Kaspar Hauser and the general consensus of both popular and psychological opinion have prepared the way for a clear recognition of the importance of inter-subjective intercourse in the development of an individual's consciousness of himself. We have now to consider carefully the main stages of that development in the history of a child, and its inter-relation with his consciousness of his environment. At what point does he first reach an ejective interpretation of others, and how does he arrive at the knowledge of self necessary for such an interpretation?

At the outset, I wish to acknowledge my great indebtedness to Baldwin for his treatment of the inter-relation of the development of the *ego* and of the *alter*.[1] But for the special purpose of discovering the part which the process of ejection plays in the life of an individual it will be advisable to consider the main stages in the child's consciousness of himself in relation to his interpretations both of persons and things.

There are distinguishable three epochs in the mental development of the child. The first might be termed the "affective" epoch; the second is the period when there is consciousness of the bodily self; and the third is marked by the rise of reflective self-consciousness.

Quite early the child is affected by, and appears

[1] *Vide* Baldwin: *Mind*, 1894, p. 29, on "Imitation"; *Psychological Review*, 1894, p. 274, on "Personality Suggestion"; *Mental Development in the Child and the Race*, 1896, ch. i. § 3, ch. vi. § 3, and ch. xii.; *Social and Ethical Interpretations*, Pt. I, ch. i.

to notice, bright lights, vivid colours, and startling noises. Its experience consists of sensations, pleasure and pain, and the motor adaptations which result from these, but there is as yet no distinct sense of self, and no objective reference. This is the affective epoch.

But soon the child begins to distinguish its own body from other extended things, and to localize organic sensations within it. Undoubtedly it takes time for the differentiation to be clearly made. For example, Preyer states that his little son bit his own arm when he was more than a year old. But gradually, by means of the exploration of its own body, the child realizes the distinction between the self and the not-self. If it presses its right hand against its left, it has the experience of muscular effort in the right and the experience of pressure, or perhaps even of pain, in the left. If now it presses its hand against that of another person, it has the feeling of effort but does not suffer the pressure or pain. And, similarly, the actions of other bodies upon its own are accompanied by pleasures and pains, while their actions upon one another are not. In Alexander's phraseology, the difference consists in the fact that the bodies of its fellows are contemplated, whereas its own is not only contemplated, but within it are also localized the mental processes enjoyed. And thus there arises a realization of a bodily *self* in opposition to which things outside are *others*.

Now it is only in this second period that there can really be said to be "objective" reference; for,

until consciousness of self has arisen in some faint degree, there can be no "object," no thing, "standing over against" the self. And the more this consciousness of self develops, the more clarified becomes the conception of an object. During this period there is no "subjective" sense of self and no sense of personality. Persons and things are both "not-self," lying outside the body. Persons are interesting, moving objects. This is what Baldwin would call the "projective" stage in one's consciousness of persons.

Gradually the child becomes increasingly interested in persons. In the first place, they are bodies which move. Then they seem to bear a very intimate relation to his own comfort. And they are more erratic than other objects, and differ among themselves in their attitude towards him.

It is not unlikely, too, that at an early age the child has an instinctive "sympathy" with its fellows. Sympathetic induction of emotion and feeling is probably displayed by all gregarious animals. For example, the emotion of fear which is induced in some members of a herd often spreads sympathetically to others who could not have been aware of the object of fear. And similar instances have been observed in the case of children. We therefore seem justified in postulating that the child experiences inarticulate "feelings with" others of its own kind before it reaches reflective self-consciousness. "Nous ne disons donc pas d'abord moi; nous dirions plutôt nous, si nous pouvions parler et traduire en mots notre disposition cérébrale,"

says Fouillée.[1] This is an over-statement of the case if it implies that *nous* can be used with real significance before there is any meaning attached to *moi*. But it is true if it be interpreted to mean that there are occasions—before and, indeed, after the rise of reflective self-consciousness—when there is no realization either of selfhood or otherhood, the usual differentiation being merged in the immediacy of the "feeling with" others. This possibility of inarticulate "feeling with" others deserves notice because it supplies a strong incentive to imitation. A similar feeling tends to produce a similar motor adaptation. Thus, if the emotion of fear induced by a certain object results in flight, the emotion sympathetically induced will tend to work itself out in a similar way. It is not difficult to see how spontaneous imitation, in which the feeling induced is strong enough to produce the reaction, may prepare the way for conscious mimicry. There may be all degrees of feeling sympathetically induced. Some may be slightly too faint to result in automatic action, and a slight effort may therefore be necessary to overcome natural inertia. If we suppose the degree of feeling aroused to decrease, the degree of effort which is necessary to eke out the first impulse to act, will have to increase. The child is thus led by stages to the point where, without the sympathetic induction of feeling, it consciously makes an effort to imitate.

By imitation of others, the chasm between the second and third stages is bridged and the child

[1] *La Psychologie des Idées-Forces*, p. 18.

acquires a subjective sense of personality. Spontaneous imitation, however, would never give rise to this third stage. In automatically dancing a familiar step, one's attention is not drawn to oneself; but if the step be a new one, the effort to imitate makes one conscious of how one is doing it. Similarly, it is the very *effort* to imitate which brings about that great line of cleavage in the child's experience which indicates the rise of volition and which separates off the series now first really subjective. Situations are now aimed at, and his attention is attracted to his power of doing things *when he wishes.* He thus comes to regard himself as an agent. Rudimentary reflective self-consciousness makes its appearance, and he assigns some meaning to "I" as distinguished from "me."

The subjective sense of personality, thus gradually gained, is used to illuminate other persons previously known only as "projects," now interpreted as "ejects." "The project of the earlier period is lighted up, claimed, clothed on with the raiment of selfhood, by analogy with the subjective. The subjective becomes ejective; that is, other people's bodies, says the child to himself, have experiences in them such as mine has. They are also 'me's'; let them be assimilated to my me-copy." [1]

This alternation from the projective to the subjective, and from the subjective to the ejective, is described by Baldwin as the dialectic of personal growth. The first step is taken by means of imitation, the second by means of ejection. If a

[1] Baldwin, *Social and Ethical Interpretations*, p. 8.

child is inclined to be receptive he will imitate his *alter*, and as a result he may gain a new subjective experience. If he is aggressive he will interpret him by ejection. Imitation and ejection are therefore complementary processes, and the dialectic consists in the alternation from one to the other. There are instances in our developed experience which will broadly illustrate it. Suppose I see a man seated in an aeroplane, and afterwards imitate him and take up the science of aeronautics, and come to understand and manage the machine. I have then reached the subjective stage and have actually experienced what are the inner feelings which accompany the outer act of flying. When I next see the man fly, I fill in, to the projective view which I first had of him, the internal accompaniments which I had when I was in an aeroplane. This is the ejective stage.

Before proceeding to attempt to represent the dialectic symbolically, there is one question which must first be considered. In order to understand another man's inner experiences it is obviously necessary to have had similar experiences; but does it follow that these must be reflected on, or explicitly discerned, before they can be utilized? In other words, is explicit self-consciousness, as distinguished from implicit, a pre-condition of ejection?

The psychological facts demand a doctrine of implicit self-consciousness. There is as much justification for it as for a doctrine of subconsciousness; for mental states influence the total situation to which the mind is attending when they are not

explicitly discerned. In adult life, for example, a man's anger may colour and modify the object at the focus of his consciousness, although he may be quite unaware that he is angry. And it would therefore seem but reasonable to suppose that, before the attainment of any explicit self-consciousness, the mental processes enjoyed may influence the object of attention. The child's milk cannot be quite the same thing to him when he is hungry and when he is not, or when he feels sick and uneasy and when he does not. His feelings affect the total situation before his mind, although he does not reflect on them. That is, he is implicitly though not explicitly conscious of them. Can he then eject that of which he is only implicitly conscious? Must he become explicitly conscious of an experience before he can use it for the interpretation of others?

At the outset, the influence of undiscerned states of consciousness on an object before the mind should be distinguished from an ejective interpretation of the object. The former is exactly equivalent to the influence of marginal objective consciousness, but the latter implies a conscious separation of the subjective from the objective. That the distinction is not artificial can be readily seen from an example. Suppose that a man is so filled with annoyance and anger that his vision is distorted and he judges his dinner a miserable failure, the meat tough, the vegetables badly cooked, the pudding cold. This is a case in which anger, although undiscerned, has its effect on what is presented to the mind. But it is not a case of ejection, for what is read in is

not the subjective experience of anger but certain qualities—toughness, coldness—which are not predicated of himself. The dinner is not interpreted as being like himself, and therefore ejection, which is the interpretation of something in terms of self, does not come in. Now, suppose that he sees in another man certain external signs which lead him to infer the presence of a subjective experience similar to his own experience of anger. This is a case of ejection, and implies explicit consciousness of the subjective experience, at least at the time of the completion of the process. Are we then to conclude that explicit self-consciousness is a pre-condition of ejection? And is it necessary that not only one's subjective experience but one's awareness of that experience should always be a step ahead of the ejective interpretation?

The implication of Baldwin's dialectic of personal growth is that the passage from the projective to the ejective view of persons is only possible by way of the subjective; and there seems little doubt that an ejective interpretation of another is pre-conditioned by the possession of a subjective sense of personality. This implies a definite separation of the subjective and the objective, but not necessarily an analysis of the self into separated states of consciousness. As we have seen, the first separation takes place through the effort to imitate, but it does not follow that every step in the development of explicit self-consciousness comes about in the same way. In many cases it comes about through the use of language, which has been sanctioned by custom and which

leads to the fixation of aspects of conscious experience which are thus objectified. And the facts suggest that after the attainment of a subjective sense of personality, which is the pre-condition of all ejection, it is sometimes in and through the process of ejection itself that what was a confused whole becomes analysed and that specific states of consciousness come to be cognized. Consider again the interpretation of the pilot of an aeroplane. We have seen that by imitation of him and reflection on the new subjective experiences, a subject may gain explicit knowledge of the inner accompaniments of the outer act of flying, and thus pass from a projective to an ejective view of him. But even if he were never to imitate he could eject some subjective elements derived from the analysis of his developed experience in other directions. He has been in a racing motor-car, he has been tossed about at sea, and he has travelled upwards in a lift or perhaps even in a balloon. By the combination of relevant elements abstracted from the inner aspects of such experiences, he gains some conception of the feelings of the man whom he is watching. And the analysis and comparison make explicit a common element of which he may never before have been explicitly aware. So that it would appear to be in and through the process of ejection itself that the specific elements come to be separated off and the condition for their separate discernment comes to be fulfilled. And in less intricate cases the same may often hold good. The need for the understanding of some specific aspect of another's behaviour

may teleologically determine the analysis of the confused mass—the self—and may therefore be the means of making explicit what was before only implicit. Is ejection then a pre-condition of explicit self-consciousness rather than explicit self-consciousness of ejection?

It may be argued that it is impossible to eject that which has never been separated from other experiences. And undoubtedly there is a certain element of truth in the objection. Take a parallel case. It is impossible for a man to throw away something if it adheres to his hand. Is the separation of the thing from the hand, then, the pre-condition of its being thrown? Judged in isolation the instance appears to be one of reciprocal determination. It is in and through the act of throwing that simultaneously the thing ceases to adhere and is thrown. But from other instances it is known that although the thing may be separated and not thrown, it cannot be thrown and not separated. Therefore the separation is the pre-condition of the being thrown. But it should be noticed that the tendency to throw is present before, and ministers to the fulfilment of, the condition for the completion of the process. So it is with ejection. There are instances in which the separation of the state to be ejected has taken place before the process of ejection. But there are others in which it is in and through the process of ejection itself that the condition of separation comes to be fulfilled. In both cases the finished process is only possible when there is the separation; but in the second case the separation and the

explicit ejection of the experience are prefaced by implicit ejection—a tendency to eject, before the fulfilment of the condition for its manifestation.

To sum up, then:—All ejection seems to be preconditioned by the general separation of the subjective and the objective orders of experience. And the ejection of any specific experience naturally presupposes the enjoyment and implicit consciousness of the experience, but not necessarily its explicit discernment. There are two groups of cases. In the first, the subject either gains the experience by imitation which involves effort, or he is led in some other way to reflect on the experience before the need for its ejection arises. The order of development is, therefore—projective view, imitation with effort, explicit consciousness of the inner experience, explicit ejection. And the development might be represented symbolically as follows: Suppose that a child A, whose consciousness of himself at a certain point is representated by A^1, is receptive towards B. By imitating B he may come to possess a new subjective experience B^1 and to reflect upon it. Now suppose that A comes in contact with C, towards whom he is aggressive, and sees him perform an action like that which B originally performed. The conception of C realized by A will be b^1C, where b^1 represents the factor introduced into A's interpretation of C owing to his consciousness of his own subjective experience B^1.

But there are other instances where the very need to interpret the behaviour of others will result in the separation of states of consciousness hitherto undis-

tinguished. The order of development will then be—implicit consciousness of the experience, projective view requiring interpretation, implicit ejection, leading simultaneously to separation (which implies some degree of explicit consciousness) and to explicit ejection. This process will have to be represented symbolically in a different manner from the previous case. Suppose the child A has had a certain subjective experience B^1, but has never been explicitly conscious of it. His total consciousness of himself is, however, influenced by it, and might be represented as $\text{Æ}B^1$. Now suppose that he wishes to interpret the behaviour of C. Then in this process there may result simultaneously the separation of B^1 from $\text{Æ}B^1$ and the interpretation of C as b^1C.

In adult life we are often furnished with the data for ejection by the analysis of old subjective experiences and the recombination of the elements derived from them, the analysis taking place either before or in the process of ejection. But the child has to gain these subjective experiences one by one. There are so many things which he sees done by others of which he himself has no analogous experience. And such experience as he possesses is inchoate, lacking that explicitness and orderliness which would alone enable him to know in what direction analysis would prove useful. Therefore, in order to understand, he has to resort continually to imitation. If the imitation is accomplished by considerable effort, he may not only gain the experience, but also knowledge that he has it. But in any case it is by imitation that he comes to live

through experiences of which he afterwards makes use inh is interpretation of others.

Indeed, the use of imitation is the outstanding feature of the child's life from about the end of the first to the beginning of the fifth year; and he remains persistently though selectively imitative of deeds, of habits, of games, and of customs until a much later period. The clearer singling out of the self as the centre of thought and activity which results is plainly evidenced in the change in his use of language with reference to himself. At about the age of two years there is a transition from the use of "Baby," "X," "Y," or "Z," to "I." Different observers have assigned the date of this change at 24, 25, 26, 27 months, or even earlier—at 19 or 20 months—in exceptional cases. The precise times of the change are of little value, owing to the fact that they depend partly on the nurse or mother, whose language the child to a large extent adopts. But, at least, they serve to show that after a period of persistent imitation of the acts of others, the child gains a realization of itself as subject which is clarified and stereotyped by its use of the pronoun "I."

This realization has important results. The newly acquired subjective sense of personality dominates for a time his interpretations not only of persons but of inanimate objects; and there is a period of relatively indiscriminate ejection. In adult life there are comparable instances of changes being brought about by the incursion of one *idée-force* into a man's system of thought. For a time he may see everything in relation to it. For example, in a case of

sudden "conversion," the acquisition of a new dominant idea may revolutionize a man's views of the whole universe. In order that such a change may be effected, the idea must gain sufficient motive-power to break through conventionalized systems of thought; and the "conversion" is therefore often attended by a tremendous emotional upheaval. In the analogous case in the history of the child, the new consciousness of self is gradually acquired without any great emotional disturbance. Yet the effect is similar. The newly acquired realization of the "subjective" dominates his view of his whole environment, and he sees as alive and conscious many things which to the adult are lifeless and soulless.

A few examples of the child's treatment of inert objects at this period may serve to illustrate how his views of them are coloured by his rudimentary idea of himself—as a being capable of feeling and effort. Thus Froebel quotes the case of a child who persistently called two planets "father and mother" stars.[1] And in the Russell-Haskell collection of the sayings of children there are several examples in which there is unmistakable evidence of personification. One is that of a child (J.) of about four years of age, who on seeing the water running in the gutter exclaimed: "Oh! The water is awake now; it was asleep last night." Another is that of a little girl of five years (Mabel) who remarked, on seeing a very crooked tree: "See that tree sitting down."

[1] *Education of Man*, p. 71.

What except this tendency to personify will explain the action of Miss Ingelow, who when a child, carried some pebbles in a basket from one part of the beach to another in order to give them change of scene? [1] Or what else will explain the action of another child who took the pillow of her cot into bed so that it should not feel cold?

Such illustrations suggest that there is a stage in the child's life when such personifications are seriously meant. The distinction between persons and things is not clearly drawn. I have pointed out that at an earlier period, before there is a sense of personality, the child fails to discriminate between persons and things and interprets them both as "projects." Now the child tends to interpret them both as "personal"—the counterparts of itself. Only in the course of some years does it learn to eject with discrimination and to distinguish men, animals, and the inanimate. The passage from this first to the more discriminate ejection will be considered in the next chapter.

[1] "The History of an Infancy," *Longman's Magazine*, February 1890.

CHAPTER II

THE PASSAGE FROM PRIMITIVE TO DISCRIMINATE EJECTION

To acknowledge the important part played by indiscriminate ejection in the early thought of the individual is not to accept without qualification Emerson's epigram that "childhood and youth see the world in persons." Two questions suggest themselves for consideration. First, does childhood ever see *all* the world in persons? And secondly, is the personification of youth the same as that of childhood?

It has already been shown that after the rise of the subjective sense of self there is a stage when the child ejects almost indiscriminately, and when dolls, chairs, and wooden horses are regarded by him as actuated by the same sort of personal will as himself. But even at the time when the tendency to personify is greatest there will probably be some items in his environment which will remain "projects" to him. Before the rise of reflective self-consciousness he interpreted the things around him as being independent "others" outside his own body; and it seems that in the case of uninteresting

objects this interpretation persists into the later period. The free acknowledgment of this truth does not, however, entail that the child's personification of *interesting* inanimate objects is not seriously meant. The unspeakable terror which fills his mind when, for example, he looks upon a horrible picture shows the seriousness of the interpretation. I can well remember how at one period of my own childhood a certain picture of an octopus never failed to fill me with horror. It was in a book from which I might have learned many interesting facts about different varieties of fish, but so great was my fear of that one picture that I seldom dared open the book. Such fear is only intelligible on the assumption that no clear distinction had been drawn between the inanimate picture in two dimensions of space and the living octopus in three. The interpretation was serious though not discriminating.

"'Tis the eye of childhood that fears a painted devil"; and the reason why it fears is because of this lack of discrimination, this inability to take account of differences.

How far this tendency to regard the inanimate as conscious and living is aided by mothers and nurses, it is impossible to say. When a child runs against a table, it is often taught to beat it in retaliation and to say "Naughty table!" It is taught to sing to the rain as to a person—

> Rain, Rain, go to Spain,
> And never, never come again.

It might, therefore, be urged that the child's personifications are imitative rather than natural, and would not arise apart from the treatment which he receives at the hands of his nurse or mother. But such a view supplies no *raison d'être* for that treatment. Why should women have adopted this way of dealing with children? To suppose that they have chosen to do so arbitrarily, without any reason, is equivalent to accusing them of sheer lunacy. As a matter of fact, it is their united insight into the psychology of the child that is responsible for the evolution of these customary ways of assisting its development. Rightly interpreted, such rhymes and customs are but further evidence of the generality of the child's tendency to personify.

But there is development in the use of ejection from childhood up to youth. In the words of Ward, the "primitive imputation of personality, though it facilitates a first understanding, soon proves itself faulty." Gradually the differences which exist between himself and inanimate objects begin to have weight with the child, and he ceases to regard them seriously as personal. But for a longer time he ascribes the same properties to animals as to men. Thus, for example, after he has ceased to think that balls which collide hurt one another, or that they stop rolling because they are tired, he will interpret his kitten as living a mental life analogous to his own. His development takes place roughly in two stages, in the first of which he learns to distinguish between inanimate objects and himself, and in the second, between the

lower animals and himself. This is what would be expected, since the outstanding differences would naturally be attended to first.

The child's progress is of course aided by his social environment. He soon learns to accept on the whole the interpretation of the external world adopted by his immediate forefathers. He enters into their thought without going through the whole of the tedious process by which it was evolved in the history of the race. He is not left alone to seek his interpretation of the universe, and on that account the period during which he seriously ejects indiscriminately is not only comparatively short, but is also of confused outline.

It should be noticed that the fact that the first imputation of personality has to be modified does not mean that the ejective factor is ever eliminated —even from man's interpretations of the inanimate. It exists whenever he speaks of things resisting, exerting force, pushing, etc., or whenever he uses such conceptions as power, substance, and end, for the description of inorganic Nature. What happens is that the differences are allowed some weight of influence, and the ejection is not of the whole self but of more or less suitable elements derived from it. We no longer regard such objects as chairs, tables, dolls, as the analogues of our whole selves; but we eject those elements which the experience of the race has shown to be nearer analogues of the thing to be interpreted. Thus, although all personifications are ejections, not all ejections are personifications.

The stage when both persons and things were "projects" was followed by a period when the child tended to regard both as personal. Now they are clearly distinguished; and the conceptions of both are thus clarified together. The earlier conception of a thing as outside the body is completed by regarding it as a cause of movement or of resistance to pressure.

Such discriminate ejection is impossible without analysis of the empirical self, although it is often in and through the very process of ejection that the analysis takes place. It will therefore be seen that the passage from primitive to discriminate ejection is correlated with development in the analysis of subjective experiences. The deeper and more adequate the analysis, the more discriminate the ejections. Not only, then, is there inter-relation between the development of the *ego* and of the *alter*, but there is likewise interdependence between the growth of consciousness of self and of the external world. The *greater* one's knowledge of self, the more perfect one's understanding of one's fellows; and the *deeper* one's knowledge of self, the more systematic one's ejective interpretations.

Even in adult life there are occasional lapses into interpretations which are only consistent with the anthropomorphism of the earlier period. For example, a grown man has been known to throw over an arm-chair because it "gave him such a blow." This is an action which is consistent with the primitive point of view, but is illogical to one who holds that a chair is neither a responsible

agent nor capable of feeling the blow of retaliation. It is a case of a return in anger to an impulsive reaction which is a relic of an earlier philosophic outlook.

There are in addition abnormal cases where the earlier interpretation persists in one or two directions notwithstanding all discrepancies. Leuba quotes the case of a lady who always regarded figures as persons, and who had also a "strong sense of the personality of trees." "My dearest friends in nature are trees—apple-trees above all others," she is reported to have said: and one apple-tree was in her opinion a kind of foster-mother to her.[1] These interpretations were not quasi-poetical or playful, but were seriously meant.

So far the development in the systematic interpretation of one's environment through discrimination in the use of ejection has been considered as though it took place alone. As a matter of fact, the case is complicated by a parallel development. When the child has realized the distinction between persons and things, it does not follow that it never personifies things. It often has two interpretations side by side, the one seriously meant, discriminate and systematic, the other playful, indiscriminate and discursive. And a complication is introduced by the fact that it is not always able to distinguish between its playful and its serious interpretations. At the same time that the development in the systematic interpretation of its environment is proceeding, there is also a development in its power to discriminate between belief and make-belief.

[1] J. H. Leuba, *Monist*, vol. 10, 1900, p. 544.

The whole period from the time when the newly acquired sense of self begins to dominate the child's interpretation of its environment until the ejection has become discriminate may be roughly divided into three divisions. In the first, such personification as occurs is serious. In the second, the serious interpretation is becoming more discriminate, but there stands side by side with it a playful interpretation, and these two are insufficiently distinguished. In the third and last period, the systematic interpretation is relatively discriminate and is also clearly distinguished from the playful personifications which are allowed to exist side by side with it.

Most of the child's life falls into the second division. The first period is short, because the child is hurried on to interpretations more in line with those of its fellows. On this account the indiscriminate ejection which held the race in its grip for so long is probably most adequately reflected in the play-interpretations of the child.

The most meagre and least promising of things are transformed in play into complete living forms. The sofa-arm will serve equally well as a coal-black steed, a snow-white palfrey, or an obstinate donkey. The child will at times talk to such unpromising things as a cushion, a sponge in a bath, a poker, or a clothes-prop in the garden.

If nothing better offers, the little girl will nurse and talk to a bundle of hay tied round the middle with a string. It is her baby who loves and kisses her in return—only grown-up people cannot see. She acts towards it as her mother acts towards her. She

ejects into it her feelings: she regards it as living, speaking, crying, good or naughty, as it pleases her. She cognizes it ejectively.

In a particular case it is difficult to estimate how far the imagined interpretation is known to be playful. Many children, for example, feel actual sorrow when their dolls are broken and injured. It is no uncommon thing to see a little girl weep bitterly when her doll's eye comes out, or to see her filled with horror at the sight of the sawdust running out. Who can presume to tell how serious was the child's anxiety for the welfare of her dolls when she wrote to her father the following letter?—

> Do, please, take care of all my precious dolls while I am gone, and tell Mammy to feed them well and sit by them while they go to sleep, and let them all sleep together in my bed. Tell them I miss them, I miss them very much; and tell my go-cart that, too.[1]

In such cases the line between the playful and the serious is undoubtedly confused, but gradually the distinction is more and more clearly drawn. And games involving dramatic personification come to be prefaced by the remark, "Let's pretend." "Let's pretend that that big old tree is Goliath, and that you're Saul, and I'm David." Here the personification is known to be make-belief, and is only indulged in to give "David" an opportunity of slinging his stones under dramatic and interesting circumstances. But when night falls and "David" can hear the weird and awe-inspiring sound which the wind makes in

[1] *N. Amer. Rev.*, vol. 185, p. 352.

that giant tree, the line of demarcation between pretence and truth begins to grow confused. What if the tree is Goliath, or at least is vowing vengeance for the blows received! There are numerous examples in child-life of such alternations between two inconsistent interpretations. The same child who will tell you that the wind is caused by a big fan—an interpretation denoting a somewhat scientific outlook—will also talk as though it were alive when it hears it moan at night.

During this second period the child delights in books in which personification abounds and animals and inanimate objects are made to speak and act like human beings. *The Adventures of Brer Rabbit*, in which the animal kingdom is described as though it in no way differed from mankind in intelligence or conduct, the pictures of Louis Wain representing animals in circumstances only possible to men, are an unfailing source of delight to all normal children. Books like Maeterlinck's *Blue Bird*, in which not only the cat and dog, but the bread, the sugar, the water, the fire, and the light are personified and communicate their inner thoughts, or Carroll's *Alice in Wonderland*, Barrie's *The Little White Bird*, and Grimm's and Hans Andersen's *Fairy Tales*—all of which contain numerous interpretations of things and animals gained by indiscriminate ejection—are the favourites of childhood.

In the third period, the playful personifications which persist are clearly distinguished from interpretations seriously meant. There are cases in the life of the child when games are indulged in with as

clear a recognition of the playfulness of the interpretation as we reach in adult life. In looking back upon my childhood, it seems that there was one game involving personification which was regularly played without the slightest confusion between belief and make-belief. Pictures of children which had been cut out from fashion-books and had their names written upon their backs were used to form a school. These drawings were personalized, each one having characteristics which continued from game to game. The clearness in discrimination in this particular case may have been partly due to the lateness of its introduction, but it is to be accounted for mainly by the fact that the pictures were cut out and named, that is, were in a way created by the player.

Similarly in adult life playful and systematic interpretations may exist side by side, although inconsistent with one another; and there is no danger provided that the two are clearly separated. Thus, the Fellow of an Oxford College who spoke of almost every tree and stone as though it remembered all that had been enacted in its presence could scarcely be accused of illegitimate ejection. The interpretation arose out of his intimate knowledge of, and deep affection for, his college, and was known by him to be playful and quasi-poetic.

And in general there exist, and there ought to exist, two interpretations of our environment: the one concrete, playful and discursive; the other abstract, serious and methodical. The first interpretation is that of poetry and corresponds to the play

interpretation of the child. It has no methodology. It concentrates on resemblances; and on that account "animism (or indiscriminate ejection) is an important element, if not in truth the very substance of imaginative literature." The second is that of philosophy and science, and aims at being consistent and systematic. The differences have therefore to be weighed and the ejection employed has to be discriminate.

The fact that the ejection of the poet is indiscriminate as judged by scientific standards does not mean that it is illegitimate for the particular purpose in view. Confusion only occurs when his interpretations are not distinguished from those of systematic thought. Thus, although the scientist would have no right to affirm the presence of any emotion in a "crowd of daffodils," it was perfectly allowable for Wordsworth to sing of them :—

> Ten thousand saw I at a glance
> Tossing their heads in sprightly dance.
>
> The waves beside them danced, but they
> Outdid the sparkling waves in glee.

For Wordsworth is only concerned to give in broad schematic outline the picture before his view; and he can describe that concrete vision most easily by concentrating on outstanding resemblances and ignoring differences. The interpretation is therefore playful in the sense that differences are consciously and purposively ignored.

Similarly no one ought to accuse Dickens of

illegitimate ejection in the following description of a fruiterer's shop at Christmas :—

> There were great, round, pot-bellied baskets of chestnuts, shaped like the waistcoats of jolly old gentlemen, lolling at the doors, and tumbling out into the street in their apoplectic opulence. There were ruddy, brown-faced, broad-girthed Spanish onions, shining in the fatness of their growth like Spanish Friars; and winking from their shelves in wanton slyness at the girls as they went by and glanced demurely at the hung-up mistletoe.

Now, even a popular scientist is certainly not allowed the privilege of describing Spanish onions as "winking from their shelves in wanton slyness," nor French plums as "blushing in modest tartness from their highly decorated boxes." He is bound by the laws of his own methodology. If he were to attempt to describe them, he would state their size, colour, and so on—that is, he would be concerned with different aspects of the onions. But Dickens wishes to give a concrete picture of them, and he therefore personifies them. And the interpretation is legitimate, because the author clearly realized that he was concentrating on resemblances in order to effect his purposes. From one point of view, his is a "play" interpretation. But in many such cases it is possible that, on account of its very concreteness, the "play" interpretation comes as near to the truth as does the scientific, which is analytical and abstract. In any case the two may reasonably be allowed to exist side by side, provided there is no confusion between them.

SECTION II

THE DEVELOPMENT OF EJECTIVE PROCESSES

A PHYLOGENETIC STUDY

CHAPTER III

THE INDISCRIMINATE EJECTION OF THE SAVAGE

It has often been said that the history of the child is a repetition of the history of the race, both human and sub-human. The individual in embryo passes through stages which represent morphologically those actually found in the ancestral animal series. And after birth the main stages of development correspond to the outstanding culture epochs of the human race. But owing to the fact that the child of civilization is born into a society whose prevailing philosophy is inconsistent with earlier interpretations of the world, it is probable that his history only reproduces the history of the race in very distorted miniature. Thus the period during which the child ejects without discrimination is short and of confused outline, and is only sufficient to suggest that there may be a corresponding period in the history of the race when the use of ejection was relatively indiscriminate.

And such certainly proves to be the case. The

prevailing philosophy of savage races is animistic—being the outcome and development of that earliest analogical reasoning which concludes that external objects are animated with a life essentially similar to that in man.

"To the lower tribes of man," says Tylor, "sun and stars, trees and rivers, winds and clouds, become personal animate creatures, leading lives conformed to human or animal analogies, and performing their special functions in the universe with the aid of limbs like beasts or of artificial instruments like men. . . . The basis on which such ideas as these are built is not to be narrowed down to poetic fancy and transformed metaphor. They rest upon a broad philosophy of nature, early and crude indeed, but thoughtful, consistent, and quite really and seriously meant." [1]

Among others, Frazer, Lang, and Lubbock are in general agreement with this position. Thus Frazer says, "To the savage the world in general is animate, and trees and plants are no exception to the rule. He thinks that they have souls like his own, and he treats them accordingly." [2]

And Lang even goes so far as to make this use of indiscriminate ejection the distinguishing feature of the savage mind. Thus he defines a savage as "he who (extending unconsciously to the universe his own implicit consciousness of personality) regards all natural objects as animated and intelligent beings, and, drawing no hard and fast line between himself

[1] *Primitive Culture*, 1903, vol. i. p. 285.
[2] *The Golden Bough*, Part I, vol. ii. p. 12.

and the things in the world, is readily persuaded that men may be metamorphosed into plants, beasts, and stars; that winds and clouds, sun and dawn, are persons with human passions and parts; and that the lower animals especially may be creatures more powerful than himself, and, in a sense, divine and creative." [1] The same truth is summed up shortly in one of Lang's later works in reference to the Iowas, Kanakas, Bushmen, Murri, and New Zealanders in the following words: "All these, and all other savage peoples, believe in a kind of equality and intercommunion among all things animate and inanimate." [2]

Such a general view is also supported by the specific observations among different tribes of Im Thurn, Le Jeune, Schoolcraft, and others.

Thus Im Thurn, speaking of the native of Guiana, says: "To the Indian, all objects, animate and inanimate, seem exactly of the same nature, except that they differ in the accident of bodily form." [3] And further: "Not only many rocks, but also many waterfalls, streams, and indeed material bodies of every sort, are supposed to consist each of a body and a spirit as does man." [4]

Schoolcraft supports the same view in reference to Algonkin races. And Father Le Jeune, a Jesuit missionary to Canada in the seventeenth century, is reported to have summed up his view after a

[1] *Myth, Ritual, and Religion*, 1887, vol. i. p. 31.
[2] *Custom and Myth*, 1893, p. 136.
[3] *Among the Indians of Guiana*, 1883, p. 350.
[4] Id. p. 355.

long term of work among the Algonkin Indians in the following words: "Les sauvages se persuadent que non seulement les hommes et les autres animaux, mais aussi que toutes les autres choses sont animées."

Anthropologists are, then, generally agreed that an animistic interpretation of the world is natural to man at an early stage in his development. And the evidence that has led them to this conclusion is of two kinds. First, there is the direct evidence that comes from the study of the actual beliefs and customs of tribes at a low stage of culture. And secondly, anthropology has at its command indirect evidence which it has gained by the comparison and analysis of those myths, folk-tales, and customs, among civilized races, which are survivals of earlier systems of thought and are now recognized as being playful or semi-playful in character. It will be impossible to consider all these anthropological data in anything like detail. All that can be done is to take illustrative examples of the chief kinds now at our disposal. Our plan will be to consider the direct and then the corresponding indirect evidence on any point.

Numerous examples might be quoted to illustrate the savage's belief in the animation of such outstanding "inanimate" objects as the sun, moon and stars, rocks, waterfalls and rivers, and the wind and clouds. Not all tribes personify the same things; for not only may they be at different stages in the passage from primitive to discriminate ejection, but their attention and interest may have been turned into different directions. But generally (although

even in this there are a few exceptions) the sun, moon, and stars—the most striking of natural phenomena—are regarded as living lives analogous to those of men or beasts. Tylor quotes a large number of examples in this connection. On the authority of Father Le Jeune, it is said that to the Algonkin Indians the moon is the wife of the sun. There is an eclipse of the sun when he holds the boy that was born of their marriage in his arms and an eclipse of the moon when she in her turn embraces him. The Mbocobis of South America, the Peruvians, the Mexicans, and numerous other tribes, are cited as having similar interpretations of the sun and moon involving personification. Sometimes the sun is the husband of the moon, sometimes the wife. Sometimes they are both women, as in the view of the Mintira of the Malayan peninsula. To the Esquimaux they are brother and sister, the moon being the girl, who always flees from her brother because he once disfigured her face.

One of the most adequate explanations, on account of the comparatively wide range of facts which it co-ordinates, is that of the Piute Indians of California. In their view the sun is the father and ruler of the heavens. The moon is his wife and the stars are their children. But the cruel father eats his children whenever he can catch them, and therefore they flee before him and only feel safe in the heavens in their mother's company. Every month he is successful in catching some of them, and therefore the moon, who loves her children, is grieved and hides her face with a veil.

But whether the interpretations are surprisingly superficial or comparatively adequate, almost all agree in regarding the sun and moon as persons or animals with appropriate qualities and passions. There is, however, at least one notable exception. The Gallinomeros of Central California are said to believe that the sun and moon are balls of fire carried into the sky by the Hawk and Coyote, who once came into collision and determined to prevent the recurrence of a similar accident.[1] This is certainly not in line with the usual interpretations of primitive peoples.

Perhaps there is a survival of the "personal" explanation of the sun and moon in the old nursery rhyme "Sing a Song of Sixpence," which it has been suggested is probably a relic of a Nature Myth describing the break of day. The "four-and-twenty blackbirds baked in a pie" are the twenty-four hours contained in one day. The King who "was in his counting-house, counting out his money" is the sun with his wealth of golden sunbeams; and the Queen who "was in the parlour, eating bread and honey" is the moon with her honey-coloured moonbeams. "The maid in the garden, hanging out the clothes" is the dawn hanging out the clouds. The best evidence of the probability of this explanation is to be found in the fact that it gives some meaning to the hitherto unintelligible jingle of words. The rhyme becomes a description of what happened "when the pie was opened"—that is, at the break of

[1] Lang, *Custom and Myth*, p. 133.

day. We are first told, with the double meaning in the words which is dear to the heart of the punster, that "the birds began to sing." Not only did the metaphorical blackbirds—the hours—begin to awake, but the real birds began to sing as they do at the break of day. And the sun was getting ready, adding up his wealth of sunbeams, and the moonbeams were disappearing, being swallowed by the moon. Dawn was hanging out the clouds, when with dramatic suddenness we are told there came one of the hours (possibly that immediately following the hour of dawn) and "snapped off her nose," thereby giving her her *congé*.

It will have been noticed that in the tale of the Piute Indians to which reference has already been made, not only the sun and moon but the stars were personified, the latter being very naturally regarded as the children of the former. Somewhat similarly the Mintira suppose that the stars are the children of the moon, the sun having swallowed the children which she once had. Perhaps more often the stars are regarded as transformed human beings. Thus, the Kasia of Bengal declare that the stars were once men and climbed to the top of a tree. Others below cut the trunk, and so they were left up there in the branches. And similar notions are found among the Esquimaux, Bushmen, Australians, and Red Indians. In fact, the belief in animal and human stars or groups of stars is practically universal at a low stage of culture.

Not only the star-lore of Egypt, India, and

Greece, but even our own astronomical nomenclature, bears the impress of this earlier period. Castor and Pollux, the Bear and the Pleiades, names inherited by us from Greek mythology, must have arisen out of a serious belief in the animation of the stars. The indirect evidence therefore agrees with the direct. As Tylor puts it: "The savage sees individual stars as animate beings, or combines star-groups into living celestial creatures, or limbs of them, or objects connected with them; while at the other extremity of the scale of civilization, the modern astronomer keeps up just such ancient fancies, turning them to account in useful survival, as a means of mapping out the celestial globe."[1]

The savage's interpretations of the sun, moon, and stars have been considered in some detail, because they serve to illustrate his attitude to many other interesting natural objects. But there is another class of inanimate objects to which the attributes of personality are sometimes ascribed by him—namely, fetiches. All kinds of odds and ends which have been connected with magical practices may be accredited with mysterious powers, and may therefore come to be regarded and worshipped as the habitations of spiritual beings. In such cases the personification is not due to pure animism, but partly owes its origin to magical practices. It is, however, worthy of notice in this connection in so far as it betokens a confusion between the animate and the inanimate.

[1] *Primitive Culture*, vol. i. p. 357.

The savage, then, fails to distinguish clearly between persons and things. And his interpretation of animals shows a similar tendency to level everything up to equality with the human status. He deliberately assigns human qualities to animals. Thus Tylor cites the example of some negroes who declared that apes really can speak, but they judiciously hold their tongues lest they should be made to work. So firm was their belief that animals in effect are simply "men in fur and feathers," that they ignored differences which they themselves had actually observed.

Such a "levelling up" may very naturally lead to a belief in man's kinship with animals. If the inner life of animals is much the same as that of men, there is nothing inconceivable in supposing that men are descended from beasts. The institution of totemism on which many savage societies are based depends upon this very supposition. Different clans have different totems—animals or plants from which they think they are descended and which they therefore hold in reverence. They will not eat of their own totem except sacramentally. And so serious is their belief in totemism that it governs many of their social arrangements. Thus marriage is prohibited between men and women of the same totem, as a general rule. For example, among the Murri a man descended from the Quail may not marry a Quail woman. He must marry a woman of the Cockatoo, or the Pelican, or the Boa snake.[1]

[1] James Dawson, *Australian Aborigines*, 1881, pp. 26–7.

Among our folk-tales there are many which shadow forth the earlier and over-anthropomorphic interpretation of animals. First there are tales of friendly animals of the *Puss-in-Boots* order, which suggest that there was a time when our forefathers believed that animals and even insects remembered, and on occasion rewarded, a man for past kindnesses. One example will be sufficient in this connexion. In *The Queen Bee*, Grimm relates that not only the swans, but the ants and bees whose lives the hero had saved, united to help him in the accomplishment of the difficult tasks which were necessary for the breaking of a certain spell, and which eventually resulted in his happy marriage to "the youngest and prettiest princess."

The equality between men and animals in the folk-lore world is further evidenced by such tales as *Beauty and the Beast*, in which an animal and a woman are married. In the more primitive versions the beast is a beast pure and simple; but in later and more familiar forms the beast is a prince who has suffered metamorphosis at the hands of an enchanter. Both variations illustrate the "levelling up" process; the first because of the marriage between a beast and a daughter of man, and the second because of the transformation of a man into a beast.

An attempt has been made to prove two propositions: first, that to primitive man the inanimate is often personal, and secondly, that in his view the lower animals are very little different from himself except on the outside. There is, then, a general failure to discriminate between the inner aspects of men, animals, and the inanimate. This is further borne out by

certain of his customs in respect to vengeance. He takes revenge upon the inanimate. Thus the native of Brazil bites the stone he has stumbled over or the arrow that has wounded him. And the Kukis of South Asia carry out without discrimination their law of vengeance—a life for a life. If a man is killed by falling from a tree, his relations cut the tree down and scatter it in chips.[1] A relic of this custom is to be found in Athenian law, according to which any inanimate object which had caused the death of any one without proved human agency could be tried in a court of justice. In an attenuated form it appeared until recently in English law. A cart-wheel, or a tree, or any object that caused the death of a man, was, according to law, "deodand"—given to God—that is, was forfeited and sold for the poor.

The same lack of discrimination between men, animals, and the inanimate is in line with, though not the sole source of, the savage belief in the possibility of metamorphosis. The primitive mind experiences little difficulty in supposing that the souls of men may dwell in animal or inanimate forms. From this it is but a short step to the belief that the "medicine man" has the power to assume at will the shapes of beasts, birds, insects, or inanimate objects, or to cause others to be transformed. Such a belief is, of course, partially due to magical practices, but it would scarcely be possible for any one to hold it who had learned to eject with discrimination and had therefore realized the difference between the inner life of men, animals, and the inanimate.

[1] Tylor, ibid., vol. i. p. 286.

Indirect evidence of the earlier belief in metamorphosis is also supplied by the folk-lore of civilized peoples. Reference has been made to the examples of men being changed into stars which occur in Greek mythology. And the folk-tales in which the civilized child still delights abound in illustrations of the transformations of men into animals and inanimate objects. The prince becomes a beast in *Beauty and the Beast*, he becomes a frog in *The Frog Prince;* and there seems to be no object so far removed from man that metamorphosis into it is conceived as impossible. The wide range of changes conceived as possible is well illustrated in the following poem attributed to Taliessin, a Welsh bard of the sixth century :—

I have been in a multitude of shapes,
Before I assumed a consistent form.
I have been a sword, narrow, variegated,
I will believe when it is apparent.
I have been a tear in the air,
I have been the dullest of stars,
I have been a word among letters,
I have been a book in the origin,
I have been the light of lanterns
A year and a half.
I have been a continuing bridge
Over threescore Abers.
I have been a course, I have been an eagle.
I have been a coracle in the seas;
I have been compliant in the banquet.
I have been a drop in a shower;
I have been a sword in the grasp of the hand;
I have been a shield in battle;
I have been a string on a harp,
Disguised for nine years.

This examination of the customs and beliefs of primitive man has revealed a lack of discrimination in his use of ejection, comparable to that observed in the case of the child soon after the rise of the subjective sense of personality. In order to prove that the savage tends to see the world in persons, it has been allowable, so far, to consider Animism as forming a single growth.

But Marett's very careful analysis of pre-animistic religion in *The Threshold of Religion* has shown that we ought to recognize two periods. If Animism implies, as it does to Tylor, a belief in the existence of *souls*, then we ought to recognize an earlier growth—Animatism which results from simple straightforward acts of personification without such reflective accompaniments as would lead to a theory of personality like that of the possession of a soul. Marett thinks that it is impossible to deny "that in response to, or at any rate in connexion with, the emotions of awe, wonder, and the like, wherein feeling would seem for the time being to have outstripped the power of 'natural'—that is reasonable—explanation, there arises in the region of human thought a powerful impulse to objectify or even personify the mysterious or supernatural something felt." [1] And such personification may occur before there is any theory or conception of a "soul."

The following example taken from Marett is illustrative of an interpretation due to animatism rather than animism.

When a thunderstorm is seen approaching a Kaffir

[1] P. 11.

village, all its inhabitants, led by its medicine man, have been observed to rush to the nearest hill and yell at the hurricane to divert it from its course. This does not imply any belief in a soul or spirit. And the same is true of the following examples quoted by Lubbock. The Esquimaux thought that Captain Lyons' musical-box was the child of his small hand-organ. And the Bushmen supposed that Chapman's big wagon was the mother of his smaller ones.[1] In none of these cases of personification is there any implication of a belief in "souls."

The distinction between animatism and animism explains what would otherwise be a notable exception to the view that the savage tends to eject without discrimination. In the Report of the Cambridge Expedition to the Torres Straits, Haddon says: "I was distinctly informed that no animal, plant, or inanimate object had a 'lamar'" (ghost or spirit).[2] But according to the same report the mythology of the people abounds in personifications. The stars are transformed human beings. The Moon is the husband of Ilwel—the evening star—and so on. The explanation of this apparent inconsistency is probably to be found in Marett's distinction. Here is a people who have never adopted a thoroughgoing animistic philosophy—possibly because they distinguished between men and the inanimate more or less clearly before they evolved a theory of "lamar." But their semi-playful mythological beliefs point to an earlier period when the prevailing and serious philosophy was animatistic.

[1] *Origin of Civilization*, p. 33. [2] Vol. vi. p. 252.

We are therefore led to the conclusion that before man reaches to any conception of "souls," there is a period when whatever is mysterious is interpreted by him to be vaguely personal. This view is borne out by the fact that in the history of the child there appears to be a period when personifications depend for their existence on a subjective sense of self, and not upon any theory or conception of a soul. Man has not to wait to evolve a theory of souls or ghosts before using ejection to interpret either his fellow-men or any other objects. At any stage after the rise of reflective self-consciousness he may use such knowledge of himself as he possesses to interpret his environment. His realization of himself as an agent or a power will thus be used before he has any clear belief in the existence of even his own soul.

The recognition of this pre-animistic period is of importance in accounting for the origin of animism. Tylor, following Spencer, accounts for the animistic philosophy of the savage by the "dream theory," which asserts that the conception of a soul was evolved by reflection upon the objective phenomena of death, trance, and sleep, and the subjective experience of dreams. Such a theory probably accounts satisfactorily for the evolution of the idea of a "soul"; but it scarcely explains why at a certain stage many inanimate objects in no way connected with the phenomena of death and sleep should be regarded as indwelt by a soul. The postulation of a period of animatism prior to the attainment of a conception of a soul is thus a necessary supplement to Tylor's explanation. If man's interpretation of his

environment is at one period dominated by his newly acquired sense of himself as an agent, and if afterwards he evolves a conception of a soul in the manner suggested by Tylor, what is more natural than that he should sometimes use his new conception to explain those objects previously conceived as powers?

The acknowledgment of this primitive tendency to eject indiscriminately, which is due to the domination of the subjective sense of self, seems then to be a necessary supplement to Tylor's account of the origin of animism. Both animatism and animism are due to ejection. In the former case, what is ejected is the general sense of personality; in the latter, the self ejected is modified by the theory held with respect to it. In the one case the self is vaguely felt as a power, in the other it is conceived as a soul; but in both there is a lack of discrimination in the use of ejection.

CHAPTER IV

THE PASSAGE FROM PRIMITIVE TO DISCRIMINATE EJECTION

It has already been shown that at a low stage of culture the use of ejection is relatively indiscriminate. Yet it must be acknowledged that savages treat certain phenomena with which they are very familiar just as we do. There are a certain number of things that are not personalized. Owing to the fact that there is nothing mysterious requiring explanation they are practically dealt with in ways which do not suggest the prevailing animistic interpretation. For example, even in the earliest stages of culture the attitude of man tends to be eminently practical towards those objects which he is accustomed to use and handle. As long as these continue to react as might be anticipated from previous experience, there is no incentive to seek an explanation for their behaviour, or to infer internal conditions to account for it. There is therefore no motive for ejection. Even if one could trace back the history of the race to a period soon after the rise of reflective self-consciousness, when ejection first became possible, one would expect to find such exceptions ; for the earlier "projective" interpretation would undoubtedly per-

sist in the case of the most familiar things. In fairness, then, it must be granted that while seriously adopting an animatistic or animistic philosophy, the savage at the same time treats a number of ordinary things just as the civilized adult does to-day. He has his *practical* arts as well as his animistic philosophy.

The method by which man's *theoretic* interpretation of his environment is gradually modified has now to be considered. In the case of the child it was shown that earlier personifications may persist as "imaginative literature" after they have ceased to be serious philosophy, and that a development occurs in the ability to discriminate between play and serious interpretations. The same is true of the race, but it will be unnecessary to deal again with this development. What remains to be considered is the method by which more adequate *serious* interpretations are evolved out of earlier views. Suppose that a savage interprets some outstanding natural phenomenon as being personal. How does it come about that this interpretation is ever modified? The examination of the parallel problem in the history of the child will have prepared the way for the solution of this question. The development takes place by means of an alternation analogous to the dialectic of personal growth. After a time the savage may observe some fact about the object which contradicts his first interpretation, and this discovery naturally makes him distrust himself and his explanation. He is therefore inclined to be at the "receptive pole" (as Baldwin terms it), where he takes up into himself new evidence. Then he becomes "aggressive"; and he proceeds to eject

a nearer analogue to gain a modified interpretation. This alternation may be repeated, the observation of inconsistent facts being followed in each case by an attempt to modify the ejection suitably. And since one generation enters into the thought of its predecessor without going through the whole of the tedious process by which it was evolved, progress in the understanding of the external world by this means becomes possible.

But at low stages of culture the alternation proceeds anything but smoothly. One of the peculiarities of the savage mind is to be found in its inability to co-ordinate and compare. The facts which do not agree with the accepted interpretation are often ignored and suppressed, and so progress is blocked at the first stage. And even if the discrepancies are noticed, modification does not always occur, for the savage is essentially a conservative, bound hand and foot by tradition. Rather than change his forefathers' interpretation, he will joyfully put up with surprising inconsistencies. It is only very slowly, and probably at great cost to the pioneers—among whom would be numbered not only those naturally progressive but also those peculiarly liable to contrary suggestion—that the use of ejection becomes more discriminate.

The main stages in the evolution of the interpretation of natural objects may be broadly illustrated by reference to the sun. It has already been pointed out that the first interpretation tends to be animatistic, and the second animistic. In both, the differences that exist between the object and mankind are ignored. But after a time many savages have been led

to ask why the sun always runs over the same course. A man goes where he wills, but the sun keeps to a fixed path and has to rise and set with regularity. There is therefore a noticeable difference; and the first step seems to be an arbitrary addition to the original explanation, to account for it. Many postulate that some one caught and tamed the sun by physical force or by the art of magic. Thus the Aborigines of Victoria believed that at the beginning the sun did not set. "It was at all times day, and the blacks grew weary. Nooralie considered, and decided at length that the Sun should disappear at intervals. He addressed the Sun in an incantation interpreted thus: 'Sun, Sun, burn your wood, burn your internal substance, and go down.' The Sun therefore burns out his fuel in a day and goes below for fresh firewood."[1] The New Zealanders and the North American Indians, to whom the sun is a great beast, explain his "tame" behaviour by supposing that he has been trapped by hunters. In these cases there is no denial of life to the sun, but some reason is advanced to explain the limitation of his freedom.

In time this animistic explanation with arbitrary additions gives way before an interpretation in which the ejection is more discriminate. The sun itself comes to be regarded as a mere physical phenomenon, and the personal element of the old conception separates itself and becomes a god. The physical object no longer stands to a spirit in the relation of body to soul. It is rather the home of the sun-god or the chariot which he drives. It may

[1] Brough Smith, *The Aborigines of Victoria*, vol. i. p. 430.

even cease to have any very direct spatial connexion with him when he assumes anthropomorphic form and becomes the Apollo, Heracles, and Hyperion of Greek, the Frei of Scandinavian, or the Lugh of Irish mythology. Similarly the visible sky ceases to be a person and becomes the abode of a sky-god, like the Zeus of Greek mythology or the Indra of the oldest Vedic literature.

The full import of this change will be more clearly seen if we consider a number of objects grouped together as a class rather than a single object like the sun or sky. Let us take the case of trees. As the animistic becomes a polytheistic interpretation, the tree ceases to be regarded as the body and becomes the dwelling-place of a tree-spirit, who can now quit it and return to it at pleasure. Instead of a tree-spirit for each tree, there comes to be a god for the whole class. And when he is in a measure disengaged from each particular tree, he is conceived in concrete human form, his specific character being merely denoted by a branch or some equally obvious symbol. The connexion between the trees and the god thus grows less and less direct. In this way the polytheism of Greek, Roman, and Scandinavian mythology is a great advance on the older animism in the direction of withdrawing the conception of personality from the "inanimate" things of the world. It attempts a compromise with the earlier desire to personify, and at the same time allows of a practical interpretation which becomes increasingly discriminate as the god is more and more separated from the physical object. The way is thus prepared for

the discriminate ejection of the civilized adult of to-day.

The race has now learned to distinguish between the inner life of men, animals, and inanimate objects. In interpreting our fellow-men, we suppose that they have feelings, purposes, thoughts, and volitions, similar to those which we know we possess. When they perform actions which would be accompanied by volition in us, we believe that they also are prompted by volitions. In the past we have acted on this belief; and our experience continually supports the view of the thoroughgoing analogy between them and ourselves.

There are, of course, individual differences in behaviour which ought to be taken into account, and the greater the differences which exist between the interpreted and the interpreter, the more care must be taken in order to eject with discrimination. It is this fact which accounts for the difficulty we experience in correctly interpreting foreigners, children, savages, and the abnormal. On the whole, however, the differences which exist between our fellow-men and ourselves are comparatively slight.

In the comparison of the lower animals and ourselves, the analogy is found to be less thoroughgoing; and we therefore gradually learn to replace the primitive ejection—according to which animals were thought to have souls—by an ejection not of the whole, but of the lower elements in our consciousness. At first, as Ueberweg remarks, the uneducated consciousness is liable to the fault of raising the lower too nearly up to its own peculiar

nature,[1] but later we learn to infer consciousness in kind and degree according to the closeness or remoteness of the analogy.

There has been a similar development from the primitive to the modern interpretation of inorganic nature, due to the continual use of the dialectical method. Let us consider the case of the development in man's interpretation of such a phenomenon as that of a magnet attracting iron filings. James once asked what was the difference between this and the case of Juliet attracting Romeo. We want to go a step further and to ask how the observed differences have modified the ejective interpretation. Anthropomorphic thought would explain the attraction of the magnet for the iron in terms of the concrete subjective experience of love. But two kinds of differences are observable. In the case of the magnet, there is both an absence of adaptiveness and an absence of selectiveness. For example, a small piece of wood placed between the magnet and the iron would effectively prevent the two from coming together: but Romeo would climb over a corresponding barrier; for to some extent he can vary the means to attain a fixed end. That is, he has the power to adapt himself to changed conditions. And, again, Romeo might decide not to see Juliet, for the sake of the future; but when the iron is in close proximity to the magnet it has no power to select whether it will or will not react. The observation of these differences has now resulted in a clear distinction being drawn between actions

[1] *Logic*, § 42.

which are the expressions of minds like our own and those which are not, and the interpretation of the magnet's action in terms of love and volition has therefore been superseded by one which takes account of these differences and postulates a blind force. This explanation, however, only became possible by the provisional use of the earlier hypothesis.

It should be noticed that the ejective element has not been eliminated in this new interpretation. The objective facts actually given are the relative positions in space of the iron and magnet at two consecutive points of time. Yet as soon as an attempt is made to explain the change in relative positions, we have to suppose that they were "attracted" to one another, that some magnetic "force" drew them together. Now, the "force" or "attraction" thus postulated is not and never can become an *object* to the observer. It is not empirically given, but is read into the objective data and owes its origin to the analysis of subjective experiences.

In conclusion, then, the continual alternation between the aggressive attitude in which men interpret external phenomena in terms of self and the receptive attitude in which they seek for justification for this interpretation, has led to our ejecting our concrete subjective experiences to interpret other men, certain elements derived from their analysis to interpret organic nature, and certain other more abstract elements to interpret inorganic nature. The ejective factor in each case may have to be still further modified as our understanding of our-

selves increases and new objective facts are discovered. And the question arises: Can it ever be eliminated as long as the interpretation is the interpretation of a being with subjective experiences? And if so, would the interpretation reached be that of the ideal of positive science?

PART III

THE RELATION BETWEEN A THEOLOGICAL, A METAPHYSICAL, AND A SCIENTIFIC INTERPRETATION OF THE WORLD

PART III

THE RELATION BETWEEN A THEOLOGICAL, A METAPHYSICAL, AND A SCIENTIFIC[1] INTERPRETATION OF THE WORLD

CHAPTER I

THE ASSUMPTIONS OF SCIENTIFIC POSITIVISM

In the light of the study of the development of ejective processes, there remains to be considered the problem of the relation which exists between the different modern interpretations of the cosmos. What, for example, is the relation between the theologian's interpretation of the universe by a

[1] It should be stated for the sake of clearness that by a theological interpretation of the world I do not mean an interpretation —whether given by revelation or not—which claims to be authoritative in the sense that it falls outside the range of philosophical criticism. Neither am I concerned with a theological interpretation in so far as it essentially includes an element of worship. In fact, it is only the interpretations of what might be called theological philosophy which lie within the scope of this enquiry.

The term "metaphysical" is used throughout in the somewhat restricted Comtian sense in opposition to "theological" on the one hand and to "scientific" on the other.

doctrine of immanence and the scientist's interpretation of the same universe as a system of laws? Are the two views contradictory? And if so, ought the second to replace the first in the history of thought?

Comte would give a very definite answer to the last question. According to his formulation of the "law of progress" there are three stages in the development of every branch of knowledge—the theological, the metaphysical, and the scientific. In the first stage physical processes are explained by "spirits," in the second by metaphysical entities which might be termed "shadows of spirits." In the third stage man finds out that the function of knowledge is to ascertain relations, and he therefore gives up the search for causes and concentrates his efforts on the discovery of those invariable natural laws which appear to govern phenomena.[1]

"The spirit of all theological and metaphysical philosophy," says Comte, "consists in conceiving of all phenomena as analogous to the only one which is known by immediate consciousness, Life."[2] The first, or theological, explanation of the world is therefore gained through personification; the second, or metaphysical, through quasi-personification; and it is only in the third or scientific that there is adequate description. In other words, the interpretations of the theologian and metaphysician are dependent upon the use of ejection; but the ejective factor is eliminated in positive science,

[1] Comte, *Positive Philosophy*, tr. Martineau, vol. i. ch. 1.

[2] Ibid. p. 239.

which is superseding, and ought to supersede, these earlier interpretations.

The complex problem with which we are here concerned was thus solved by Comte in a way that is undeniably attractive on account of its very simplicity. At first sight it might even appear as though he had "unloosed the Gordian knot." But the more one considers the question, the more one is forced to the conclusion that there are assumptions underlying Comte's view which ought not to be accepted without careful and impartial examination.

The "law of the three states" is supposed to be empirically traceable in the history of thought, and thus interpreted it implies, firstly, that science is actually replacing metaphysics and theology, and, secondly, that scientific interpretations are rectilinear descendants of "theological" or anthropomorphic views. It is, then, pre-eminently a pronouncement concerning the genesis of positive science. Now, on Comte's own showing there are some branches of knowledge which do not pass through the three stages. The generalization is therefore not a *law* in the strict sense of the word. It fact, it is questionable whether it is anything more than a rough statement of an imperfectly apprehended half-truth. For the most casual examination of anthropological data will show that the three states are not mutually exclusive. For example, it has already been pointed out that even at that period when ejection is most indiscriminate there are some familiar things in which man's interest is exclusively practical, and which he therefore interprets "positively": and, further, that

there was a projective or "positive" stage prior to the ejective, or, as Comte would call it, the "theological" stage. On the other hand, to-day, when science has progressed beyond even Comte's expectations, there still exist, side by side with positive knowledge, theological and metaphysical interpretations which show more signs of continued growth and development than of impending decay and death. Indeed, in one place Comte himself states that theological philosophy has never been universal.[1] He even seems to think that the law of continuity requires the presence of some degree of the "positive spirit" from the very beginning. Otherwise the rise of modern science would be "scientifically incomprehensible." But he fails to see that even if it could be admitted that progress consists solely in the gradual decrease of the "theological" spirit, the same law of continuity might require that some degree of it should remain in the final or ideal interpretation. But such an argument from an *a priori* law of continuity can have little weight in this discussion, which is concerned with the examination of the data of genetic psychology in so far as they bear on the question of the relation that exists between theological, metaphysical, and scientific interpretations. And the facts are certainly not so simple as Comte's "law" would seem to imply, for all along the line the different interpretations exist side by side, although oftentimes they are confused. Now, it might be urged that the validity of the "law" does not require an all-round, consistently positive or theological interpre-

[1] *Positive Philosophy*, Bk. VI, ch. vi.

tation at any one period. All that is necessary is that in regard to a special group of phenomena the positive interpretation should replace the metaphysical, and the metaphysical the theological. Man may be a "theologian" with regard to a group of phenomena A, a "metaphysician" with regard to another, B, and a "positive scientist" with regard to a third, C. All that such a situation implies is that he is at different stages of development with regard to the three groups. Given time enough, the "law" will prove itself valid. Now, even if this case represented the full extent of the difficulty, the law would appear to be in serious jeopardy unless it could be assumed that the knowledge of A, of B, and of C could be kept in watertight compartments—an assumption which is obviously absurd. It is only reasonable to suppose that the high stage of development with regard to C would influence the development of the interpretation of A and serve to eliminate the intermediate metaphysical stage. A law of two rather than three states would therefore appear to be obeyed in this case.

But the difficulty is greater than is represented here. The fact is that the *same* man appears to oscillate between different interpretations of the *same* group of phenomena. Not only may he have an anthropomorphic interpretation of a group A and a positive interpretation of a group C, but he may have both an anthropomorphic and a positive interpretation of A. For example, some tribes at a low stage of culture plant and weed and reap in a manner that is evidence that they have some positive knowledge of husbandry. But this does not prevent their using

incantations and charms and invoking the aid of the Rice-mother or the Corn-god. There can be no doubt that they have gathered a number of empirical rules from their previous observation of objective facts, and they *act* in accordance with these rules. And on the ground of some such superficial platitude as that actions speak louder than words, some anthropologists have judged that these rules represent the serious beliefs, and that the incantations and ritualistic ceremonies are only so many organized games, which serve to lighten the labour of harvest—just as Robert Louis Stevenson's game of landslips and inundations serves to encourage the average child to eat his morning porridge. But such an interpretation undoubtedly misses part of the true significance of savage ritualistic practices. For at the stage of culture to which our illustration belongs, the prevailing philosophy is animistic, and the belief underlying the invocation of, say, the Rice-mother is quite seriously entertained. It is otherwise, for example, with the May Day celebrations of our own time, or with the recently revived custom of carrying mascots. These practices are obviously dependent on "play" interpretations. But here I have intentionally chosen an illustration and a stage in the history of the race when confusion between play and serious interpretations is practically negligible. And there has been revealed a new distinction which may furnish an important clue to the solution of the problem of the relation between a scientific, a metaphysical, and a theological interpretation of the world.

After eliminating all *play* interpretations there

are to be found *serious* animistic interpretations side by side with a number of empirical rules based on the observed behaviour of objects. Owing to the fact that man is continually called upon to react to his environment, to adapt himself with all possible speed to external changes, he collects a number of rules which serve to guide him in action. These rules are something more than the immediately experienced sense-data from which any and every interpretation must proceed. They are not even cases of single observations of particular events. For example, suppose a savage who had had no previous experience of cutting and chipping were to cut his hand accidentally with a sharp-edged piece of flint. The natural explanation of such a new and unrelated experience would be that a devil had entered into the flint. But in contrast with this, suppose that the savage had learned to cut and chip with the flint. Out of the exercise of the mechanical skill there is born the knowledge that the flint will cut whenever certain conditions are fulfilled. There is implied here some idea of necessary connexion, either between the flint and the cut, or, if the craftsman's experience is more extensive, between the hard sharp edge and the cut. In either case the empirical rule transcends the directly presented facts of experience, and by so doing enables its possessor to anticipate the future and thus to gain control over his environment. But the so-called "positive" knowledge which man thus gains is relative to his actions, and he does not always

remain content with its superficiality. Sometimes it is borne in upon him that the external world with which he is concerned in action is big with hidden meaning, and then he not only acts or prepares to act, but he speculates. He tries to penetrate below the surface, to get behind the screen of the phenomenal and to find who or what is working there. This is the unconscious motive of his metaphysics, and it leads in turn to animistic, polytheistic, and monotheistic beliefs.

Action is man's first necessity. On this account he comes to possess a body of "positive" knowledge as soon as, if not before, he has evolved even the crudest animistic philosophy. And the method of modern science is the same as that employed in the discovery of these empirical rules connected with the practical arts. It would therefore seem that Comte is not justified in assuming that modern science is the rectilinear descendant of theological philosophy. It would be nearer the truth to say that it is the descendant of the empirical rules of which the savage makes use in action, modern theological philosophy being the descendant of primitive anthropomorphic speculation. But even this is not the whole truth, for there has been interaction, neither line of development being in any sense insulated. In the early stages the utilitarian tendency to anticipate events interpenetrates and coalesces with the speculative impulse to seek their inner meaning. It is this which accounts for such confusion as that already instanced in connexion with harvest ritualistic practices. And

at a much later stage, when along the one line of development animism had given way before polytheism, and polytheism before monotheism—at this stage there must have been interaction, and out of it modern science was born.

It is not difficult to see that science as we now understand it could not have arisen from the mere collection of empirical rules for action. The knowledge that fire burns, that sharp-edged flints cut, that seed sown at a certain time of the year springs up, "first the blade, then the ear, and then the full corn in the ear," can be styled "positive," but it is not scientific, any more than the practical knowledge of the modern artisan is scientific. Science is something more than the mere juxtaposition of a number of rules discovered on account of their practical utility. It has a dominating ideal—that of the co-ordination of the rules into one system—an ideal to which man could never have attained apart from his theological philosophy. For the first great attempt to embrace the cosmos in its totality was that of monotheism, with its dominating conception of one God guiding and controlling the whole universe, one God

> who stretchest out the heavens like a curtain:
> who layeth the beams of His chambers in the waters:
> who maketh the clouds His chariot:
> who walketh upon the wings of the wind:
> who laid the foundations of the earth
> that it should not be removed for ever. . . .
> He appointed the moon for seasons:
> the sun knoweth his going down.

And had there been no monotheist there could have been no scientist. It seemed as though a crude monotheism and a practical empiricism had to be thrown into the melting-pot together before modern science and modern theological philosophy could crystallize out.

If Comte is not justified in assuming that modern science is the rectilinear descendant of theology, neither is he justified in the main drift of his argument, which implies that progress in the thinking of the race consists of one single movement towards the elimination of the influence of ejection. Our study of genetic psychology reveals the fact that progress has taken place in at least two well-marked and distinguishable directions. Firstly, there has been increased discrimination in the use of ejection in man's serious interpretation of his environment, and secondly, there has been decreased confusion between several coexisting interpretations—between play and serious interpretations on the one hand, and on the other between different systematic interpretations arising from different impulses and adapted to different ends. In other words, progress has meant not only the gradual removal of the effect of over-anthropomorphism from man's philosophy, but also an increasing appreciation of the function of each of the different coexisting interpretations, and therefore of the degree of ejection justified in its special case. Thus poetry and systematic thought exist to-day in perfect harmony because their differentiation is practically complete. But science and metaphysics are still being separated and clarified

together. Their differentiation is still proceeding. It is only comparatively recently that the special sciences have ceased to be anything more than branches of philosophy or that the distinction between scientific description and metaphysical interpretation has been consciously recognized.

And Comte's chief merit lies in his emphasis of this very distinction. It is his insight in this connexion which constitutes his claim to importance in the history of the development of science. On the whole he was singularly unlucky with regard to his prophecies concerning the future of science. What can be thought of the scientific acumen of a man who asserted that psychology had no future, and who poured scorn on the scientific hypothesis of ether? And yet his very mistakes seem to have arisen from his concentration on the ideal of a positive science clearly differentiated from a metaphysic. For example, the hypothesis of an ether was inadmissible to him because science, in order to be science, must be stripped of all metaphysical conceptions. "Those who in our day believe in a luminous ether," he scornfully declares, "have no right to despise the elementary spirits of Paracelsus or to refuse to admit angels and genii." And at no matter what cost, science must be purified of angels and genii, phlogistons and ethers—in short, of all metaphysical adulterations. It must give up the vain search for *causes*, a relic of the primitive tendency to personify, and be content to discover *laws*. "The first characteristic of the Positive Philosophy," he says, "is that it regards all

phenomena as subjected to invariable natural laws. Our business is—seeing how vain is any research into what are called Causes, whether first or final—to pursue an accurate discovery of these Laws, with a view to reducing them to the smallest possible number."[1]

Comte's assumption that progress consists in the *substitution* of science for metaphysics and theology has already been shown to be an imperfectly apprehended half-truth. It is not a case of giving up the search for causes and concentrating on the discovery of laws; that is, it is not a case of substitution so much as of differentiation. Notwithstanding this, Comte's distinction between the search for laws and the search for causes may throw some light on the principle upon which the differentiation has proceeded, and in the next chapter, which is concerned with the discovery of this principle, it will therefore be necessary to consider in some detail the conceptions of cause and law which in his view underlie metaphysics and positive science respectively.

[1] *Positive Philosophy*, vol. i. p. 5.

CHAPTER II

THE DIFFERENTIATION OF SCIENCE AND THEOLOGICAL PHILOSOPHY

According to Comte, the conceptions of cause and law underlie metaphysics and positive science respectively. We are thus provided with a rough and ready principle of differentiation, and by means of the analysis of the two conceptions it may be possible to refine this principle, and in so doing to throw light on the problem of the relation of scientific, metaphysical, and theological-philosophical interpretations of the world.

Consider first the conception of cause. What is implied when it is stated in regard to a sequence of motion in the external world that A is the cause of B? On this question it would appear that philosophers have ever been divided into two opposed camps. Of the one camp, Locke might be taken as representative; of the other, Hume. Locke asserts that the notion of cause originates in a man's direct experience of causality in himself. "The idea of the beginning of motion we have only by reflection on what passes in ourselves, where we find by experience that, barely by willing it,

barely by a thought of the mind, we can move the parts of our bodies which were before at rest." [1] In other words, the only case in which there is direct experience of causality in the sense of dynamic determination is in our own volitions. When a man wills to walk across the room and close the door, and then does what he willed, he has a direct experience of a cause which is immanent in the process as the *power* on which it depends. And in no other case of sequence of motion—not even that in which the initiator is a fellow human being—has he such a direct experience. The activity of the cause is read in, or, in the words of A. E. Taylor, "results from the ascription to it of the characteristic feeling of self-assertion and self-expansion which accompanies our own voluntary interference in the course of events." As De Biran puts it: "The source of all our ideas of power and causation is the self, the self conscious of itself as Will, i.e. as a free, originative power." Or Beneke: "We *are* causality; and thus there is constituted this relation to an inner given something which . . . is then, by a process of transference, hypothetically assumed to be in existence external to ourselves."

Now, in the case of a fellow-man the ascription of causality or agency may be legitimate, whereas in other sequences of motion it may result from over-anthropomorphism or indiscriminate ejection. Thus, when a man voluntarily turns the handle of a barrel-organ, he is conceived as having caused or initiated certain changes which result in the production of

[1] Locke, *Of Human Understanding*, Bk. II, ch. xxi. § 4.

certain sounds. And similarly, the wind turning a windmill is sometimes regarded in popular thought as the active power which initiates the movement. Although it may be allowable to infer an element of efficacy in the first case and not in the second, the point to notice is that in neither is it objectively given. Rather in both it is ejectively introduced. This is the first view of the origin of the conception of causality.

In opposition to this view, Hume finds the origin of the notion of a causal relation between two events in the strong expectation which is built up from their constant repetition in the same order, or, in his own words, in "the customary transition of the imagination from one object to its usual attendant." "When uniform instances appear, and the same object is always followed by the same event, we then begin to entertain the notion of cause and connexion. We then feel a new sentiment or impression, to wit, a customary connexion in the thought or imagination between one object and its usual attendant; and this sentiment is the original of that idea which we seek for." [1]

Hume then denies that the origin of the conception of cause is to be found in our unique experience of ourselves as causal agents. For in the first place, the command of the mind over the body which Locke had brought forward as the prototype of the notion eludes discernment. "The influence (of volition over the organs of the body) is a fact. . . . But the means

[1] *Enquiry*, edited by Selby Bigge, 1894, Section VII, Part II, § 61.

by which this is effected, the energy by which the will performs so extraordinary an operation, of this we are so far from being immediately conscious, that it must for ever escape our most diligent enquiry."[1] Now, this failure to understand the means is no argument against the immediately experienced fact of our own causality. The very mysteriousness of the experience, of which Hume complains, is an argument in favour of, rather than against, the opposite view. It has already been shown in connexion with Alexander's Conational Psychology, that inner experience is distinguished from outer in that it consists partly of "enjoyments." And enjoyments, *qua* enjoyments, are mysterious and elude scientific description. In the case of causality it is precisely because we have an immediate experience of it and can know it through no other channel that it cannot be described adequately or even represented to the imagination, that is, that it must remain mysterious. The failure to trace the means by which the will produces a change, that is, the impossibility of analysing the experience, is in reality a mark of its immediacy and uniqueness.

But in the second place Hume denies this uniqueness. In his view the influence of volition over the organs of the body is a fact of experience on a par with all other "natural events."[2] At this point it is well to bear in mind that, according to Hume, the repetition of a sequence in the external world adds to the belief in the relation between the cause and the effect. It is, in fact, this repetition which gives rise to

[1] *Enquiry*, Section VII, Part I, § 52. [2] Ibid.

a strong expectation, and therefore to the notion of cause or connexion. Now, in the case of the relation between the act of volition and the movement of the body, the number of repetitions adds nothing to the initial belief. For example, the first time a man makes an effort to perform some acrobatic feat and succeeds, he is conscious of the causal relation between the effort and the resulting movements. And no repetition will add anything to this experience. This in itself proves that this experience is not on a par with the experience of sequences in the external world. It is a unique experience of causality, of power rather than of connexion.

Are we, then, to deny the value of Hume's contribution to the solution of the question of the origin of cause? And is Locke's the whole solution? I think not. The opposition between the two views has revealed the fact that the popular idea of cause is composite. It consists of a confusion of two notions—power, or efficient cause, and necessary connexion. And these two have different origins. The first is gained from inner experience; the second results from the observation of repeated sequences of events in the external world. And too often there has been a failure to distinguish the two. Locke, for example, ignored the second; Hume denied the first. But Bergson's view of causation makes the whole distinction clearer, and is therefore extremely important in the consideration of the line of demarcation between science and metaphysics.

Reference has been repeatedly made to Bergson's view that the relation of mental processes to one

another is really one of interpenetration. True duration and qualitative multiplicity are the essential features of mental life. One subjective process passes into and permeates the next, and necessary connexion can therefore never be predicated of any two. For what does necessary connexion imply? It implies that the *same* cause A always produces the same effect B. Now in a qualitative multiplicity which endures by changing it is impossible that identical antecedents should ever be repeated. The same event cannot occur twice, for what lies between the two occurrences will colour and modify the later one.[1] It is therefore meaningless to say that B will occur *whenever* A occurs, for the intrinsic nature of the series prevents A from occurring more than once. Inner experience in itself will therefore never yield cause as necessary connexion. Indeed, it is only in the world of spatial and quantitative relations that necessary connexion holds good. And in this world, the finer the analysis the less do individualizing qualities seem to be left to cause and effect, and the more does the relation between them appear to be quantitative, until finally the necessary connexion ends in a blank identity.

The two conceptions are therefore clearly distinguishable. The one—cause as power—issues from inner mental life, and in it the effect is only prefigured in the cause "in the state of pure possibility and as a vague idea which perhaps will not be followed by the corresponding action." The other —cause as necessary connexion—can only be pre-

[1] Bergson, *L'Evolution Créatrice*, p. 49.

dicated of spatial relations (including temporal in so far as they are based on space), and in it the effect virtually pre-exists in the cause.

Now, the first conception of cause, gained from inner experience, has often been ejected to explain sequences in the external world. And the second, made possible by the juxtaposition of objects in space, has often been introlated into inner experience. Thus has arisen the confused composite notion of cause now in popular use. But the two meanings are being gradually distinguished, and the differentiation of science and metaphysics is intimately related to the ever growing clearness of this distinction. Modern science seems to be tending to the rejection of the idea of power as an auxiliary concept and to the acceptation of the idea of necessary connexion. No doubt there was a time when the concept of cause was used in science with the implication of agency, at least in an attenuated form. But this is no longer the case. For example, the statement that acids *turn* blue litmus red is no longer interpreted to mean that acids are active agents bringing about the observed colour change—although there is still a superficial suggestion in the words to that effect. Similarly, in the classical example that heat *causes* wax to melt, it is no longer implied that the heat is an agent initiating a certain change, but only that whenever a certain temperature is reached (under fixed or normal conditions of pressure) the wax melts. The main auxiliary concept of science is thus ceasing to be the composite idea of cause and is becoming more and more the idea of necessary connexion

And this development is intimately related to the purification of the scientific conception of law. Comte supposes that the progress of science consists in the giving up of the search for "causes" and the concentration on the discovery of "laws"; but the truth is that not all forms of the conception of cause have been eradicated, nor has the conception of law remained identical throughout its history. Rather, each has taken on a new and fairly well defined significance, and the course of the development of "law" no less than that of "cause" affords an important clue to the discovery of the ideal towards which modern science is tending.

There can be no doubt that the meaning of law was first realized in the sphere of human action. The shepherd guiding his flock, the head of a family regulating its encampments and the duties of its members, the chief of a rude society deciding momentous questions of war or peace which would affect the whole tribe—these were the earliest law-givers. And the orders given by them were the earliest laws. A law was therefore a command prescribing a course of action, and implied a law-giver who had power to enforce obedience. And when the expression "law" first passed from the sphere of human action into that of events in nature, the analogy was worked somewhat literally, and laws of nature were regarded as commands externally laid upon matter by God. Just as man can lay arbitrary commands on those under him and enforce their obedience, so, it was thought, God can impose arbitrary commands on matter. The attitude of mind

is almostly exactly that of the centurion in St. Luke's Gospel. "I am a man set under authority," he argues, "having under myself soldiers: and I say to this one, 'Go,' and he goeth: and to another, 'Come,' and he cometh; and to my servant, 'Do this,' and he doeth it. (Thou also hast a similar authority over the forces of nature and canst issue a new command at will. Therefore) say the word only, and my servant shall be healed."

Later, when the regularity of the happenings of nature began to have its appropriate influence on the conception, the element of arbitrariness was greatly reduced. It was true that in certain miraculous cases God did overrule a law, but on the whole, divine action followed certain customary and therefore predictable lines. The element of enforcement and the implication of a Law-giver, however, still remained.

In really scientific use the expression "law" obtains a somewhat different significance. It is true that there are still many writers whose formulation of laws implies a substantial cause—it may be God, or an abstraction, Nature—and who speak of laws as being *obeyed* by phenomena: but the stricter scientists, while not necessarily denying that there may be a Law-giver, at least assert that His apprehension lies outside the realm of science. They do not suppose that the "Seate" of Law is "the bosome of God." They concentrate on the discovery of uniformities or regular sequences in nature, and these they term "laws of nature." The empiricists even eliminate the element of "necessity," as well as "enforcement," from the concept of law. For example,

Karl Pearson affirms that in no case can science demonstrate any inherent necessity in an observed sequence, nor prove with absolute certainty that it must be repeated. A law of nature is therefore only a description in mental shorthand of the sequences of our perceptions.[1] The suggestion of "necessity," as well as "enforcement," results from the weakening by abstraction of the conception of efficient cause. To admit it is therefore to harbour a quasi-personification. "Fact I know and Law I know," says Huxley, "but what is this Necessity save an empty shadow of my mind's own throwing?" Science, as distinguished from metaphysics and theology, ought only to recognize the sequences actually given in objective experience. If she admits this "necessity," this "empty shadow of the mind's own throwing," then, when attacking the supposed anthropomorphism of theology, she lays herself open to the retort "*Tu quoque!*" This is the position of the empiricists who form the extreme wing of the army of scientists. And it is not difficult to see to what it leads—namely, the denial of the possibility of a scientific *interpretation* of the world. A shorthand registration of facts, however convenient, however complete, can never claim to be more than *descriptive*. It is no different in kind from the artisan's practical generalizations or the savage's empirical rules for action. To be an interpretation it must be something more than an arbitrary juxtaposition of fortuitous observations of sequences and regularities. It must be guided throughout by a

[1] *Grammar of Science*, ch. iv.

dominating ideal. Scientific empiricism rejects both the ideal of a universe which is governed or indwelt by God and that of a universe which is a system of laws. It abandons the problem of interpretation or leaves it in the hands of metaphysicians and theologians. The line of demarcation between science and theological philosophy would therefore not be difficult to draw if all scientists were pure empiricists. Science would be the direct descendant of the positive knowledge of the savage, and its function would be entirely utilitarian, whereas theological philosophy would be the descendant of anthropomorphic speculation, and its function would be interpretative. But there are few men in the ranks of science who are prepared to occupy an apparently impregnable position at the sacrifice thus demanded. The view of the great majority implies that while it is illegitimate for science to retain any suggestion of enforcement, it is permissible for her to use the concept of *necessary connexion* as an ideal towards which her analyses should tend. Necessity and enforcement are not absolutely identical — as the empiricists seem to suppose. For example, certain theorems with regard to the nature of a triangle—that its three angles are together equal to two right angles, that any two of its sides are together greater than the third —lie implicit in the very meaning of "triangle"; that is, in a certain sense they can be said to pre-exist within the definition. The relation between definition and theorems is therefore one of necessary connexion, but it contains no suggestion of enforcement and no ejective element. Now, science can

use this concept of necessary connexion without, on that account, being tainted with anthropomorphism. And on the whole this is what she tends to do.

The course of the development of the concepts which underlie all the sciences, namely, cause and law, would therefore seem to point to the complete elimination from science of the idea of cause gained from subjective experience and then ejected to explain the external world, and to the final recognition of the idea of necessary connexion first used to interpret objective experience and finally introlated to explain conscious life. A scientific interpretation of the world would therefore seem to be broadly differentiated from a theological-philosophical, in that it tends to be introlative and not ejective.

Contrast, for example, the theological interpretation of the universe—

> All are but parts of one stupendous whole
> Whose body Nature is, and God the soul,

with the mechanist's interpretation of it as a system of laws—a series of causes and effects which in unbroken continuity compose that which is, and has been, and shall be. The former is ejective, the whole being conceived by analogy to self. And comparable to this are all interpretations which depend on the use of ejection and which can be classed together either as theological or as metaphysical in the special sense in which these terms have been used throughout this discussion. Leibnitz's monadology, Schopenhauer's conception of

the world as will, Fechner's panpsychism, Ueberweg's hypothesis of sentient matter, Clifford's doctrine of mind-stuff, Browning's principle of love, the scientist's conception of the world as force or energy — all these are ejective, the subjective being used to interpret the objective.

But it is otherwise with the mechanistic interpretation of the universe, according to which the smallest change in the future is already predetermined in the present and would therefore be calculable by mathematical formula, provided only that the analysis of present conditions were sufficiently accurate and exhaustive. Here, instead of the subjective being used to interpret the objective, the objective is allowed to cast a shadow on the subjective. The relation of necessary connexion which naturally pertains to space is applied to the interpretation of inner life, and it is therefore not to be wondered at that progress in science has so often seemed to mean "the extension of the province of what we call matter and causation, and the concomitant gradual banishment of spirit and spontaneity." [1]

It is necessary to guard against a possible misunderstanding on one important point. Theological-philosophical and mechanistic interpretations do not differ from one another, as the positivists seem to suppose, in that the former alone goes beyond the actually presented data of experience. The truth is that both interpretations transcend the data, but in different directions. When a subjective cause, whether it takes the form of God, or world souls, or

[1] Huxley.

spiritual monads, is read in to co-ordinate presented facts, the interpretation obviously transcends the data, just as the interpretation of a fellow-man as a living conscious being transcends the actually presented facts of his behaviour. And in a mechanistic interpretation, there is a comparable transcendence of data in the presupposition of an all-embracing system of necessarily connected parts. For in mechanistic science as well as in theological philosophy, there is a principle of unity which is really prior to all explanations of particular matters of fact—namely, the principle of necessary connexion. Laplace, for example, takes this principle for granted and enounces it openly as a scientific axiom. "A thing cannot begin to be without a cause to produce it," he says. And on the strength of this postulate he concludes: "We ought, then, to regard the present state of the universe as the effect of its antecedent state and as the cause of the state that is to follow. An intelligence which for a given instant knew all the forces by which nature is animated and the several positions of the beings composing it, and which in addition was vast enough to submit these data to analysis, would include in the same formula the movements of the largest bodies in the universe and those of the lightest atom. Nothing would be uncertain for it, and the future, like the past, would be present to its eyes." [1]

But this predictability of which Laplace seems so certain—in fact, this whole conception of the universe as a huge mechanism—obviously depends on the

[1] *Essai philosophique sur les probabilités*, 1825, pp. 3 and 4.

initial postulate of necessary connexion, which is no more given in direct experience than are Fechner's "souls" or Browning's principle of love. Like them, it is something other than the sum of the data which it co-ordinates; it is a principle in the light of which experience is interpreted. For, in the first place, it should be noticed that science conceives of the whole universe as a system of laws, although the amount of empirical material actually reduced to law is small compared with the vast amount that remains more or less crude and intractable. As Ward puts it: "The range of our experience in space and time is infinitesimal compared with the extent and duration of the universe. . . . The conception of Nature then, as a system of laws, is, we must say, hypothetical; since it is not self-evident but admits of question and awaits verification. But it is an indispensable hypothesis, or postulate; for without it scientific experience is impossible."[1] And in the second place, the fact that observed deviations from law are continually accounted for by the supposition of error in the experimenter suggests that it is not the data that force the conception of law upon us but we upon them. "When we come to the more complex phenomena with which we have to deal," says Balfour, "the plain lesson taught by personal observation is not the regularity but the irregularity of Nature. . . . This apparent irregularity of Nature, obvious enough when we turn our attention to it, escapes our habitual notice, of course, because we invariably attribute the want of observed uniformity

[1] *Naturalism*, vol. ii. pp. 232–3.

to the errors of the observer. And without doubt we do well. But what does this imply? It implies that we bring to the interpretation of our sense-perception the principle of causation ready-made. It implies that we do not believe the world to be governed by immutable law because our experiences appear to be regular; but that we believe that our experiences, in spite of their apparent irregularity, follow some (perhaps) unknown rule because we first believe the world to be governed by immutable law. But this is as much as to say that the principle is not proved by experience, but that experience is understood in the light of the principle." [1] C. S. Peirce goes even further, for he uses these deviations from exactitude to cast doubt upon the universality of the sphere of law. "Try to verify any law of nature," he says, "and you will find that the more precise your observations, the more certain they will be to show irregular departures from the law." [2]

That there are these observed deviations from practically every formulated law of science is not denied; but since they are sometimes in one direction and sometimes in another, it is considered permissible to take averages and allow them to compensate each other. Of course there is no objection to this from a practical point of view. But it should be realized that the legitimacy of the method of taking averages rests ultimately on the assumption that the deviations are due to subjective error and not to objective irregularity. For if there were a

[1] *Foundations of Belief*, 1895, pp. 130–2.

[2] "The Doctrine of Necessity examined," *Monist*, ii. p. 329.

class of phenomena not exactly conformable to law, the method of taking averages would undoubtedly prevent its discovery. This will be clearly seen from an example. Suppose that several cases of chemical combination between two elements A and B were investigated, and the weight of B that combined with a certain weight of A was determined in each case. The results might be as follows :—

$$(1)\ A : B :: X : Y + \alpha$$
$$(2)\ A : B :: X : Y + \beta$$
$$(3)\ A : B :: X : Y - \alpha$$
$$(4)\ A : B :: X : Y - \beta, \text{ etc.}$$

By the method of taking averages it would be inferred that A combines with B in the proportion of X to Y. And if the deviations, α, β, $-\alpha$, $-\beta$, etc., were due wholly or in part to objective irregularity, the taking of the average would give the appearance of conformity to the law—that A and B combine in the proportion of X to Y. Now, it is from just such data as these, and by the disregard of small deviations, that the chemical laws of definite and multiple proportions have been deduced. And the more carefully the laws of nature are examined, the more do they appear to be uniformities of this statistical kind. This does not mean that the formulation of such laws does not serve a useful purpose in enabling man to gain control over nature. Indeed, it rather suggests that it is because of their usefulness in the sphere of action that regularities are discovered and that the law of causality is accepted as a scientific postulate. In any case, as

Ward says: "We do not obtain the conception of natural law and natural uniformity by an antlike accumulation of particulars. . . . Impressions do not generate these conceptions for us, but we apply the conceptions to them, thereby converting and transforming these crude experiences into the one 'Objective Experience' we call science."[1]

In conclusion, then, mechanistic science, as well as theology and metaphysics, transcends the data which it co-ordinates. But its transcendence is not ejective, and its interpretation of the universe is therefore broadly distinguishable from those which might be termed theological-philosophical and metaphysical.

[1] *Naturalism*, vol. ii. p. 225.

CHAPTER III

THE EJECTIVE ELEMENT IN THE SPECIAL SCIENCES

(PHYSICS, CHEMISTRY)

It has been shown that a theological-philosophical interpretation of the universe is broadly distinguishable from a scientific in regard to the ejective element which it contains. But it does not follow that there is no ejective element in the special sciences. It may be true that a mechanistic interpretation of the world is introlative and not ejective, and yet, since the different sciences are practically self-normative, ejective auxiliary concepts may be used by one science and rejected by another. It might therefore be possible to arrange the sciences in the order of the degree of ejection employed, and thus by an understanding of their relation to one another to obtain from *within science itself* a clue to the solution of our main problem.

Mechanics, which necessarily deals with equations, seems to employ no ejective concepts. But as soon as we pass from mechanics to physics there come into use certain auxiliary concepts—matter, energy, and force—which represent something more than

merely quantitative relationships. Do these then contain an ejective element?

One of these—force—obviously lies outside the range of objective experience, and by some physicists it has therefore been relegated to the shades of the obsolete and antiquated as an unnecessary hypostasis, or else it has been retained merely as a means of condensing descriptions. "Force," says Tait, for example, "is a mere phantom suggestion of our muscular sense. . . . It is a matter for serious consideration whether we do not connive at a species of mystification by thus employing, in the treatment of objective phenomena, a term for a mere sensation, corresponding to nothing objective: even although it be employed solely to shorten our statements or our demonstrations."[1] And the ordinary text-book definition of a force as "any *cause* which tends to alter a body's natural state of rest or of uniform motion in a straight line" shows that in the conception there is involved the idea of cause in the sense which has already been shown to be anthropomorphic. "Force," says Du Bois-Reymond, "(so far as it is conceived as the cause of motion) is nothing but a more recondite product of the irresistible tendency to personification which is impressed upon us; a rhetorical artifice, as it were, of our brain, which snatches at a figurative term because it is destitute of any conception clear enough to be literally expressed."[2] Instead of the thunderbolt

[1] *Properties of Matter*, p. 13.

[2] Quoted by Lange, *History of Materialism*, tr. Thomas, 1877, vol. ii. p. 378.

being thrown by Jove, it is conceived as set in motion by something called a force. The striking god has therefore been partially, but not completely, de-anthropomorphized. But striking gods and forces agree in this, that both can only be inferred from their manifestations; they are not objectively given but are ejectively introduced.

It is for this reason that Tait rejects forces and begins by supposing that in the physical universe there are only two classes of *things*—matter and energy. These he states can be known by the senses. But it is evident that what is known by the senses is not matter nor energy, but the properties of the former and the manifestations of the latter. It is a natural movement of the human mind to suppose that there are *things* behind these. In all such cases of hypostasis, whether of matter, energy, heat, or electricity, there is introduced the category of substance, which is of subjective origin. But apart from this, is there any ejective element in either of the two conceptions?

Energy is usually defined as "power to do work." And the conception of power has already been shown to be ejective. Man only knows power directly within himself, and when he conceives of matter as possessing energy or "power to do work," he is reading in what is not and never can be objectively given. Or, take Barker's definition. "Energy," he says, "may be defined as a condition of matter in virtue of which any definite portion of it may be made to effect changes in other definite

portions." [1] Although the actual use of the word "power" is here avoided by a periphrasis, there still remains the implication that energy *effects* changes; that is, that it is an agent, a *cause* in the anthropomorphic sense of the word, something conceived as distantly analogous to the self known only in inner experience. This will become more evident if the relation between matter and energy be considered.

Matter has been variously defined by physicists as that which exerts or can be acted on by force, that which possesses inertia, that which requires the expenditure of work to put it into motion, that which in virtue of its motion possesses energy, and that which is the receptacle or vehicle of energy. It will be seen that with the single exception of the first, which would have to be rejected if force has only a "phantom" existence, all these definitions depend in the last resort on energy. And it is surely remarkable that, of the two supposed objectively real things in the universe, one is only definable in terms of the other. "Matter," says Tait himself, "is simply passive (inert); energy is perpetually undergoing transformation. The one is, as it were, the body of the physical universe; the other its life and activity." [2] That is, from certain manifestations it is inferred that there is something at work in the universe which bears a relation to matter similar to that which our life and activity bears to our body. This principle is energy. It is not known by the senses, but is ejected to explain

[1] *Text-book of Physics*, 1892, p. 4.
[2] *Properties of Matter*, p. 7.

objective data. "The notions of Matter and Power," says Ueberweg, "denote two ways of comprehending things; on the one side by sense perception, on the other by the analogy of the internal perception of our own power of will." [1] The latter way of "comprehending things" is obviously equivalent to ejection; and it is this which gives rise to the notion of energy.

But it might be urged that in any case matter is "known by the senses" and has no ejective element. Now, it is remarkable that the development of the scientific conception of matter has on the whole been in the direction of resolving it into force or energy. There was a time when matter was regarded as "a dark, inert, rigid, and absolutely passive substance." If it was conceived as having an atomic constitution, the atoms were hard, inelastic, and passive, and indeed, according to Newton, were only put into motion after creation by a special act on the part of God. But later there was a refinement of the atomic theory, by Boscovich. He conceived of each atom as being a geometrical point, towards or from which certain forces tended; and the whole sum of existence consisted of systems of forces arranged round geometrical points. There was no such thing as absolutely passive matter.

It is safe to say that on the whole a more dynamical conception of matter has now taken the place of the earlier Newtonian view. Mechanics has given way to energetics. With the exception of Kelvin's and Larmor's theories of the constitution of the physical

[1] *System of Logic*, tr. Lindsay, 1871, p. 98.

universe, there is no recent outstanding view which depends on purely mechanical principles. Kelvin supposed that space is full of a frictionless incompressible fluid of uniform density. An atom is a vortex ring in this fluid, and is distinguished from the rest by its peculiar whirling motion. Physical phenomena are therefore reduced to regular movements taking place within this incompressible fluid, and the whole is mechanically determined. But this theory has now dropped into the background. Crookes' and J. J. Thomson's recent work on the conduction of electricity through gases has resulted in a profound modification of our conception of the nature of matter; and the discovery and investigation of radio-active elements has given support to and accentuated the new theory which assigns an electrical structure to the atom.

By the passage of electric discharges through rarefied gases it has now been found possible to decompose "chemically indivisible" atoms: and no matter what gas is used, there result the same corpuscles or electrons—negatively charged particles of mass $\frac{1}{1700}$ that of the atom of hydrogen. Since the atoms are electrically neutral, this negative charge must be accompanied by an equal positive charge. Different atoms, however, have a different number of electrons, proportional to the atomic weight, and a correspondingly different positive charge. An atom is therefore a system of n corpuscles or electrons and n units of positive electricity in equilibrium, n differing from atom to atom according to the atomic weight. It is not difficult to see that in addition to co-ordinating the results

obtained in experiments on the discharge of electricity through gases, this theory also accounts for the disintegration of radio-active bodies. If one arrangement of electrons is unstable, the outer ring may break off from the system in which it revolves and one element be thus transmuted into another. But it is not with the scientific value of this development so much as with its philosophical significance that we are here especially concerned. And broadly interpreted it amounts to this: that according to the present stage of our knowledge of the properties of matter, it is unnecessary to postulate anything in the atom except positive and negative units of electricity, a form of energy. Matter, then, is in essence energy. With this advance of science it would therefore seem that the "body" of the universe (as Tait terms it) has faded away, or at least has been dissipated into thin and hypothetical ether, and correspondingly the "life and activity" of the universe has become more abundantly manifest. To the modern physicist, then, the inert, the passive, the static, is only the phenomenal; the "energetic," the active, the dynamic, is the real.

It may, however, be objected that some scientists do not hypostasize energy and regard it as actually existing. To Karl Pearson, Mach, and Nunn, for example, it is only a concept useful in the intellectual manipulation of facts. But it matters little to our purpose whether energy is regarded as subsisting or not. The vital point to notice is that the concept contains an ejective element, and its employment—even if only as an auxiliary concept—robs physics of the abstract purity of form which distinguishes

mechanics. But the acceptance of the ground of unity—energy—which introduces the ejective element into physics, also sets practical limits to its work of analysis, and thereby releases it from the complications in which mechanics would have involved it. The universe may or may not prove to be a mechanism of the kind which Laplace imagined, but in any case the final analysis which resolves everything into spatial relations concerns mechanics and not physics. Physics proceeds from a certain basis, and below this it is not its function to penetrate. Its special purposes are fulfilled before the last degree of abstraction is reached. It is therefore not only more ejective but less analytic than mechanics.

The relation between chemistry and physics is very similar. We have seen that the most recent discoveries of modern physics have led to the assignment of an electrical structure to the atom. Atoms of different kinds have been shown to consist of the same kind of negatively charged corpuscles held together by a positive charge and differing only in number and arrangement. The famous aphorism of Dalton, the founder of modern chemistry, "Thou knowest no man can split an atom," has therefore proved itself false. And yet, in a certain sense, it remains true. For it is not the function of chemistry to pursue the analysis of matter further than the systems of electrons, which are chemically indivisible. Or, expressed in terms of the atomic theory, it is not the business of chemistry to pursue the analysis of matter beyond those elementary atomic particles of which it is supposed to be composed.

Chemistry, then, is less analytic than physics. Is it also more ejective? Consider first the atomic theory, by the use of which chemistry has gained intellectual mastery of the phenomena of which it treats. It would undoubtedly have distressed Comte to have seen how the use of this theory, which is historically connected with early philosophical speculations and is in his view a mere metaphysical adulteration, has led to incessant progress in the science of chemistry from the time of Dalton until to-day. For atoms are not objectively given, and the knowledge that we are supposed to possess of them is not *positive* knowledge. Indeed, the theory can be shown to have existed before the dawn of the scientific or positive era of knowledge, not only in early Greek thought, but also in Roman, Indian, and Muhammadan philosophy.[1] Its origination in Greek thought is usually associated with the name of Democritus, but it is not unlikely that he learned it from Leucippus, whose disciple he was, and who died about the year 360 B.C. Democritus propounded the view that matter is not infinitely divisible, but that it consists of atoms which are indivisible, indestructible, and therefore eternal. Now this hypothesis of the grained structure of matter is no more ejective than is the opposite hypothesis, which regards matter as absolutely continuous. But as soon as the behaviour of the grains or atoms comes under consideration, the influence of ejection begins to be evident. For example, when Empedocles sought an explanation of

[1] Hastings, *Encyclopædia of Religion and Ethics*, article on the "Atomic Theory."

the motions, combinations, and separations of the atoms, he was led to interpret them by analogy to self, and they were therefore conceived as something more than physical divisions of matter. He suggested that their movements were determined by principles of love or hate. "And these" (elements), he says, "never cease changing place continually, now being all united by love into one, now each borne apart by the hatred engendered of strife, until they are brought together in the unity of the all and become subject to it."[1] The atoms are here conceived as possessing emotions of love and hate, or at least internal conditions comparable to our emotions. In this particular case, the anthropomorphic element is not difficult to discover, for what is ejected is a concrete subjective experience. And a somewhat similar ejective element is traceable in the atomic theory as expounded in the first century before the Christian era by Lucretius, a Roman convert to Epicurean atomism. His view is of sufficient interest to merit a somewhat detailed examination.

Lucretius was one of the most thoroughgoing materialists of early times. He rejected the polytheism of his contemporaries, and took the last step in de-anthropomorphizing natural objects. Tennyson conceives of his saying of the sun :—

> Look where another of our Gods, the Sun,
> Apollo, Delius, or of older use
> All-seeing Hyperion—what you will—
> Has mounted yonder; . . .

[1] Fairbanks, *The First Philosophers of Greece*. Empedocles, No. 66.

> . . . he knows not what he sees;
> King of the East altho' he seem, and girt
> With song and flame and fragrance, slowly lifts
> His golden feet on those empurpled stairs
> That climb into the windy halls of heaven:
>
> . . . . .
>
> And me, altho' his fire is on my face
> Blinding, he sees not, nor at all can tell
> Whether I mean this day to end myself,
> Or lend an ear to Plato where he says,
> That men like soldiers may not quit the post
> Allotted by the Gods.

And this is not an unfair representation of the negative side of his general philosophical position. In his attempt to explain the origin of the world in *De Rerum Natura* he postulates only two things, atoms and void; and one might have expected that he at least would not have admitted an ejective element into the conception of the atom, when he took such pains to eliminate it from the conception of the sun. But of the four principal characteristics which he assigns to the atoms or *primordia rerum*, one is slightly and another is definitely ejective. He supposes that the atoms are little hard kernels, "strong in their solid singleness,"[1] and therefore impenetrable, indestructible, and indivisible. Motion is inherent in them. Although a body may appear to be at rest, the ultimate particles of which it is composed are continually moving, just as an army waging war may appear from a distance to be still, when the individual combatants are moving hither and thither in every direction. Now these charac-

[1] "Solida pollentia simplicitate," Bk. I, line 574.

teristics, however hypothetical they may be, are not ejective. But when Lucretius goes on to say that different atoms have distinctive marks of their kind,[1] there is a suggestion of the possession of a low kind of individuality. And when finally he supposes that the ultimate particles, which naturally move in parallel straight lines, like drops of rain, have power to swerve from their course to an imperceptible amount and to "decline at no fixed time nor place," but according to their own volition,[2] he is endowing them with a kind of will-power similar to that which he himself possesses. There seem to be two reasons why he postulates this power of declination ; firstly, in order that his atoms may come into contact, and combination (*conexus*) become possible ; and secondly, in order to explain free-will in man. In this second reason the influence of the ejective process is particularly clear. Lucretius seems to infer that since men have a power to will, and since nothing can come from nothing, matter, from which men must have come, has free-will too. Thus, although the author of *De Rerum Natura* is superficially a thoroughgoing materialist, his theory implies a belief in a low form of panthelism, for he interprets the ultimate particles, the real, as analogous to himself in the possession of a kind of embryonic free-will.

[1] "Maculas generalis," Bk. I, line 590.

[2] Illud in his quoque te rebus cognoscere avemus,
corpora cum deorsum rectum per inane feruntur
ponderibus propriis, se incerto tempore ferme
incertisque locis spatio depellere paulum,
tantum quod nomen mutatem dicere possis"—
Bk. II, lines 216–220.

But it may be urged that the atomic hypothesis of modern chemistry is essentially different from these early metaphysical speculations. Büchner, for example, asserts that the atoms of modern times are "discoveries of natural science," while those of the ancients were "arbitrary speculative conceptions." And there are chemists who would like to deny the historical connexion between their theory and that of the early Greek atomists. They claim in any case that the reasons which resulted in the resuscitation of the atomic theory by Dalton are different from the reasons which led to its formulation. The discovery of the laws of definite and multiple proportions is supposed to have led naturally to the atomic theory, in which they found a simple explanation. It ought, however, to be remembered that the atomic hypothesis was not new to the epoch of Dalton. "Not to speak of the atomists of the seventeenth century, who had revived, though at the same time distorted, the ancient conception of the Greek philosophers, we must not forget that Van Helmont, N. Lemery, and Boerhaave had mentioned the indivisible particles of bodies and had termed them atoms, and that Boyle had tried to explain the differences between chemical attractions by the inequality of the *massulæ* or particles."[1] From this fact alone, it would not be unreasonable to suppose that Dalton already held the theory of the atomic constitution of matter before he discovered the law of multiple proportions; although until recently the question of the genesis of Dalton's theory was a subject of controversy. Was it founded

[1] Wurtz, *The Atomic Theory*, p. 29.

on an experimental knowledge of the law of multiple proportions, or did Dalton deduce the law as a consequence of the atomic constitution of matter? Henry in the *Life of Dalton* and Thomson in the *History of Chemistry* inclined to the view that the atomic theory came first, whereas Debus held the opposite opinion. But the issue has now been settled once for all by the discovery of some of Dalton's manuscripts in the rooms of the Literary and Philosophical Society of Manchester. These notebooks have been carefully investigated by Roscoe and Harden, who have been forced to the conclusion that Dalton's belief in an atomic theory led him to deduce the law of multiple proportions, which he then confirmed by actual analyses. On p. 244 of one of these notebooks there are observations on the ultimate particles of bodies and on their combinations; and there are symbols representing five elements.[1] These, and also the first list of atomic weights on p. 248, were written out on September 6, 1803. They show that Dalton must have believed in the atomic constitution of matter before he so much as began the experimental work on carburetted hydrogen in the summer of 1804 which was to lead to the formulation of the law of multiple proportions. What really happened was that Dalton accepted the hypothesis, was led to try to find the relative weights of the ultimate particles, deduced the law of multiple proportions as a necessary consequence of his hypothesis, and was therefore led to undertake experiments on the combinations of

[1] Roscoe and Harden, *New View of Dalton's Atomic Theory*, Plate 3.

hydrogen and carbon to verify his deduction. "The balance of evidence," conclude Roscoe and Harden, "is strongly in opposition to the view, hitherto held by chemists, that the discovery by Dalton of the fact of combination in multiple proportions led him to devise the atomic theory as an explanation."[1] And this conclusion is significant, for it implies that the method of the "discovery" of the atoms of modern science was not vitally different from the method by which the ancients reached their "arbitrary speculative conceptions."

The scientific atom is not objectively given, any more than was that of Empedocles and Lucretius. It is an auxiliary concept which still contains an ejective element. This element is, however, so veiled by the employment of technical phraseology, that it might easily be overlooked if it were not possible to compare modern with cruder forms of the theory. Thus there is no difficulty in discovering the ejective element in the atoms of Empedocles. But the corresponding element in the modern theory is not only more abstract, but its full implications are overlaid by technical terms. The atom of iron which combines with oxygen and not with hydrogen is no longer regarded as loving the one and hating the other, but it is said to have greater *affinity* for the former than for the latter. And the notion of affinity is either too vague to have any meaning at all, in which case its use in chemistry is a species of absolutely unjustifiable mystification, or it is a more abstract form of the earlier ejective element. In Watt's *Chemical*

[1] *New View*, p. 50.

Dictionary it is overtly called a *force* (which we have already seen to be an eject), and it is defined as "that property of bodies in virtue of which, when brought into contact, they react on each other, forming new bodies." The conception of an atom is further said to include "the possession of a *power* which determines how many atoms of another kind it can combine with." This is its valency. Whereas the physicist regards matter-in-general as possessing energy—an activity ejectively conceived—the chemist goes further and regards divisional units of matter as possessing certain distinctive *powers* of reaction. He therefore endows these divisions with a kind of functional unity and thus introduces an additional ejective element.

But it may be objected that the stricter chemists do not regard atoms as physically real, but only as convenient symbols. At the time when the Daltonian theory was sweeping everything before it, Faraday, Liebig, Davy, and Cavendish hesitated to endow atoms with physical reality. "I must confess," writes Faraday, "I am jealous of the term 'atom'; for though it is very easy to talk of atoms, it is very difficult to form a clear idea of their nature, especially when compound bodies are under consideration."[1] Yet it must be admitted that afterwards, when the particular difficulty to which Faraday refers had been solved by Avogadro's distinction between atoms and molecules (atoms being the smallest particles of an element which can take part in a chemical reaction, and molecules the smallest

[1] *Experimental Researches in Electricity*, vol. i. No. 869.

particles of a substance which can have the properties of that substance), there was a growing tendency among chemists to regard atoms as actually existing. The general acceptance of the Kinetic Theory, which states that the molecules of a gas are naturally in a state of rectilinear motion that is only changed by their impinging on the walls of the containing vessel or by their coming in contact with other particles, also increased this tendency. For this theory plainly accepts the physical reality of the molecules, which are regarded as exerting a pressure on the sides of the containing vessel measurable in terms of the number of impacts on unit area in unit time; and from it Boyle's law, Gay Lussac's law, and Avogadro's hypothesis can be deduced. "Thus the atomic theory, known to the ancients, revived by Dalton in the early years of the century, and employed by chemical philosophers for half a century as a convenient symbolism, had, about the year 1860 been accepted by physicists and used not merely as a convenient symbolism but as a physical reality." [1] By the end of the nineteenth century, scientists had so accepted the actual existence of atoms and molecules that we find them attempting to estimate their size, weight, and velocity: among chemists we find a general acceptance of the principles of structural and stereo-chemistry, which imply that atoms are linked together in compounds according to certain laws, and even that they possess a definite shape—the atom of carbon, for example,

[1] Merz, *History of European Thought in the Nineteenth Century*, vol. i. p. 437.

being supposed to be a regular tetrahedron. It is true that recently there has been a revolt amongst a few chemists against the employment of the concept of an atom in their science. Thus Divers maintained in his presidential address to the Chemistry Section of the British Association in 1902 that the atomic theory does not necessarily imply the atomic hypothesis. Divested of all reference to the physical constitution of matter it may be stated as follows: "The quantities of substances which interact in single chemical changes are equal to one another—as truly equal in one way as equal masses are in another—and therefore the chemical interaction is a measure of quantity of unlike substances, distinct from and independent of dynamical or mass measurements."[1] And in order that no implication of the atomic constitution of matter may remain, the chemist is to speak of combining or equivalent weights instead of atomic weights. But how will Divers' theory explain the fact that two elements can combine in different proportions? If 12 parts by weight of carbon combine with 16 of oxygen, according to him they are equal. But 12 parts of carbon also combine with 32 of oxygen and are therefore equal to them. The 16 parts of oxygen must therefore be equal to the 32; and Divers' statement of the theory provides for no explanation of this seeming absurdity. And how do his combining weights explain the facts of structural and stereo-chemistry? The atom may or may not be physically real, but this at least is certain,

[1] *B. A. Report*, 1902, pp. 559–60.

that the whole science of chemistry, and especially of organic chemistry, as it exists at present, is founded on the conception of an atom. Without this conception, chemistry is reduced to a chaos of facts without order; with it, the knowledge of chemical changes is marvellously systematized. Even now, when it has been shown that atoms are not indivisible but are systems of electrons, the concept remains necessary if chemistry is to fulfil its special purposes.

Whether the atom is a physical reality or only a legitimate symbol matters little to us in this stage of the discussion. What is of fundamental importance is that we should notice that chemistry is allowed an additional auxiliary concept containing an ejective element because it has a special function as distinguished from physics. And this fact removes from it the right to object to the introduction of other ejective concepts into other spheres of knowledge adapted to other ends.

CHAPTER IV

THE EJECTIVE ELEMENT IN THE SPECIAL SCIENCES (*continued*)

(BIOLOGY, PSYCHOLOGY)

THE task of discovering the ejective element in the auxiliary concepts employed in biology is obviously complicated at the present time by the conflict which is still ranging round vitalism. On the one hand, mechanistic biologists maintain that there is no need to postulate a special vitalistic principle to account for the peculiarities of living organisms. Our analysis of them is at present incomplete, but when it becomes sufficiently exhaustive it will reveal nothing except the orderly working of physical and chemical laws. On the other hand, the vitalists maintain that the activities of organisms can never be adequately described in physical and chemical terms. The complex physical and chemical processes which undoubtedly take place within the living organism are only used by life; they do not themselves constitute life. This controversy has recurred at intervals from the time of Wolff, the father of modern vitalism, until to-day: and although Harvey's discovery of the mechanical circulation of the blood, Sylvius' proof that the physio-

logical process of digestion was subject to chemical laws, and Mayer's explanation of respiration as a process of combustion, seemed at one time to herald a triumphant progress for the mechanistic school, the most recent discoveries in biology—more especially in embryology—have now again disturbed the balance of evidence. Indeed, the trend of biological thought to-day seems on the whole to be towards, and not away from, the once-despised "metaphysical" doctrine of vitalism. It is, however, still impossible to obtain an *ex cathedra* utterance on the issue; and it will therefore be necessary to divide this discussion into two parts, the first of which will proceed on the supposition that a living organism may eventually prove to be a mechanically determined system, and the second on the assumption that the distinction between the animate and the inanimate will prove to be real and ultimate and not merely convenient.

Suppose, then, in the first place, that all processes of the living organism prove to be severally resolvable into physico-chemical changes which can be carefully and fully recorded. What seems to be often overlooked is that, even on this assumption, there is room for a definitely biological description of the organism. Indeed, an exhaustive summation of the physico-chemical descriptions of its activities would leave the essentially *biological* question still unanswered. "As *biologists*," says J. A. Thomson, "we wish to describe the activity of the creature as a whole: What is the 'go' of it, how does it keep agoing? . . . . For what is a creature but a

huge army with battalions which we call organs, brigades which we call systems; it advances insurgently from day to day always into new territory —often inhospitable or actively unfriendly; it holds itself together, it forages, it makes good its own losses, it even recruits itself; it pitches a camp and strikes it again, it goes into winter quarters, it retreats, it recovers itself, it has a forced march, it conquers. What the *biologist* wishes is a description of the organism's daily march which will not ignore the reality of the *tactics*—the intra-organismal tactics." [1]

The difference between a physico-chemical and a biological point of view is well illustrated by Russell in his article on "Vitalism." [2] He shows in regard to the migration of eels that applied physics and chemistry may tell us how the energy for the journey is obtained from the eels' food and how the muscles are kept rhythmically contracting by nervous stimuli, and so on. But does all this really make the migration of the eels to the distant spawning grounds any more intelligible? "The migration," he says, "is a fact of a higher order than any physical or chemical fact, although it is made up of an indefinitely large number of physical and chemical facts. To explain the fact one must accept it *as a whole*, not seek to conquer it by dividing it, for if one analyses it into its components, one inevitably

[1] J. A. Thomson, "Is there one Science of Nature?" *Hibbert Journal*, October, 1911, pp. 119–20. (The italics are mine.)

[2] *Rivista di Scienza*, April, 1911.

misses the bond of union. . . . What one needs for an explanation of the fact is a comprehensive view which will unite all the relevant features of it into one picture. To the chemist confronted with this problem, there is no fact of migration at all; there is only an intricate enravelment of chemical reaction. To the biologist the fact of migration to a particular region for a particular purpose is cardinal, and the chemical processes involved in the action are negligible."

The biologist, then, does not pursue his analysis as far as the chemist. The special purposes of his science are fulfilled by his taking relatively synthetic views of the facts. The relation between biology and chemistry would therefore appear to be similar to that which we found to exist between chemistry and physics. It will be remembered that after the physicist has come to believe that atoms are complex systems of electrons, it is permissible for the chemist to regard them as indivisible, for the fulfilment of his special purposes. And so it is with the biologist. If we grant that chemical and physical interpretations, which differ in degree of analysis, can coexist for special utilitarian purposes, there can be no objection to the coexistence of biological and physico-chemical descriptions of an organism. For example, the act of the migration of the eels may be treated by the chemist as a complex series of chemical reactions, but it can also be interpreted biologically or less analytically, without the slightest implication of vitalistic principles. The coexistence of biology and the physical sciences is therefore not

inconsistent with the mechanist's, nor indeed with the animist's, position any more than it is with the vitalist's. The difference consists in this—that the mechanist must always regard his biological interpretations as mediate and dependent on the degree of complexity and the incompleteness of the analysis of his data, whereas the vitalist must regard the separation of biology and the physical sciences as dependent on the actual existence in Nature of distinct kinds, the living and the non-living, neither of which is resolvable into the other. According to the former, physico-chemical and biological interpretations of an organism are equally possible and legitimate, each being relative to a special purpose: according to the latter, while the physico-chemical interpretation may suffice for the inanimate, it is the biological alone which is adequate for the living organism. But in both cases the biological interpretation is less analytical than the physico-chemical. The auxiliary concepts of the physical sciences—force, energy, ether, electrons, atoms, molecules, and affinity—might therefore be expected to be inadequate for the concrete data which it is the aim of biology to render more intelligible. What, then, are its special auxiliary concepts? And how far are they of ejective origin?

We have seen in the illustration of the migration of the eels that the biologist takes a relatively synthetic view of the facts presented. He does this by regarding the physical and chemical reactions which take place as means employed for the attainment of a fixed end—an end of which the indi-

vidual eel may not be conscious, but which nevertheless seems to guide the whole series of events. He thus interprets the fact of migration as being essentially purposive; that is, he makes use of a definitely teleological concept, purposiveness. And what is true of this particular illustration is true of biology in general. "In his study of living beings," says Starling, "the physiologist has one guiding principle which plays but little part in the sciences of the chemist and physicist, namely, the principle of adaptation. Adaptation or purposiveness is the leading characteristic of every one of the functions to which we devote in our text-books the chapters dealing with assimilation, respiration, movement, growth, reproduction, and even death itself." [1]

It is scarcely necessary at this stage of the discussion to point out that purposiveness is not objectively given but is ejectively introduced. The only purpose known directly is that experienced from within, the urge of which is felt in and through the process which leads to its objective fulfilment. By analogy one is led to infer that certain actions of one's fellows are of a similar character; that is, they are fulfilments of foreshadowing ideas. And after differences have been taken into account one infers similarly that there is an element of purposiveness—of means adapted to a fixed end—in such a chain of events as that of the migration of the eels. In passing, however, it should be noticed that the biologist does not assume that the individual eel has any consciousness of the end to be attained. That is

[1] Presidential Address to Physiological Section, B.A., 1909.

a question for the comparative psychologist. But the fact of migration, as a whole, only becomes intelligible on the supposition that there is an end, whether consciously realized by the individual or not, which guides the intricacies of the various reactions in a way comparable to that in which a conscious purpose guides our actions. And the vague purposiveness thus predicated is no more objectively given than are the conscious purposes inferred to exist in the minds of one's fellows. Both are ejectively introduced, although the former is more abstract than the latter.

But it may be objected that the strictly mechanistic biologist would not admit this auxiliary concept of purposiveness. He regards an organism as nothing more than a complicated machine, every action of which is mechanically determined. Where, then, is the auxiliary concept of purposiveness in his interpretation? Now, it has been frequently pointed out that although a machine works according to strictly mechanical principles it is essentially a teleological structure. It is the embodiment of purpose and intelligence—namely, the purpose and intelligence of its inventor. Thus the mechanistic biologist who is constrained to regard an organism as a machine is unconsciously asserting its teleological nature. It is true that he is not assuming that it is itself actuated by purpose, but he is implying that it is the embodiment of purpose. And therefore, perhaps without being aware of it, he is using the concept of purposiveness in his interpretation.

And the same is true of such important auxiliary

concepts as functional wholeness and individuality. The mechanistic biologist implies these in a certain restricted sense in his comparison of the organism to a machine. A machine is the embodiment of a purpose, and its parts are therefore appropriately interrelated. They are not put together haphazardly, but in accordance with the end for which the machine was designed. So that to compare an organism to a machine is virtually to imply its functional wholeness and to predicate of it a low kind of individuality.

It is, however, in the vitalist's use that the auxiliary biological concepts are seen with their full richness and significance. And although this is not the place for a detailed discussion of the evidence which supports the view of the autonomy of life processes, it may be necessary to consider some of it in so far as it throws light on the meaning which ought to be attributed to the auxiliary concepts used by vitalistic biologists.

Much confusion of the issue between vitalism and mechanism has arisen from a failure to notice one fact, to which allusion has already been made—namely, that all *biologists* must employ such teleological concepts as purposiveness and wholeness. Otherwise there can be no science of biology as distinct from chemistry and physics, and no answer to the essentially biological question. As we have seen, this is even implied in the mechanistic biologist's comparison of an organism to a machine. And to use facts which only establish this kind of functional wholeness in support of vitalism merely

serves to confuse the issue. The facts of the adaptation of organisms to varying conditions, of the natural production of anti-bodies to counteract poisons, might conceivably be consistent with the machine theory. They certainly establish functional wholeness and purposiveness, but there is nothing to show that the wholeness and the purposiveness is not that of a machine—a specific arrangement of parts for a specific purpose, with certain mechanical devices to meet possible emergencies.

But there are certain facts of biology which go to show that the wholeness of an organism is not that of the machine order. A machine is a specific arrangement of parts, and the purpose for which it was constructed is frustrated if parts of it be taken away. But in the case of the living organism it has often been found that if a part is taken away by mechanical violence, the remaining part regenerates the lost part, and so restores the complete organism. The case of the newt's limbs is perhaps the most widely known of this kind. All such examples of restitution suggest that the wholeness of the organism is essentially different from the wholeness of any merely mechanical system. And this is borne out by recent discoveries in embryology. If the development of an organism is purely mechanical, then certain parts of the embryo should always develop into corresponding parts of the organism. Now Driesch has shown, for example, that if the egg of the sea-urchin be taken when it consists of two cells and one of them be killed, there results not the left or right half of an embryo—as would be

required according to the machine theory—but a complete embryo of half size. And a similar result is obtained if the experiment is tried at the four-cleavage cell stage. Driesch therefore concludes from these and similar experiments that the embryo is a "harmonious equi-potential" system, that is, a system in which any element can play any rôle according to what the others do; it is not a machine. He is thus furnished with one of his most important proofs of the autonomy of life.

But, however interesting the question may be, we are not here directly concerned with the evaluation of this proof, but only with the light which it throws on the precise meaning to be attributed to auxiliary concepts as employed by vitalistic biologists. Take first the concept of purposiveness. To the vitalist the organism is not a machine—the passive embodiment of a purpose belonging to some one else. The phenomena of restitution, of the development of a fraction of an embryo into a whole organism, are only explicable on the assumption that the organism is itself purposive, that it strives, that it experiences an urge towards an end, and that it uses varied means to attain that end. Its development is only intelligible on the assumption that it has within it something analogous to the inner experience of the inventor who conceived the machine and strove to materialize his conception. The organism, then, is conceived more ejectively by the vitalistic than by the mechanistic biologist. It would therefore be expected that the auxiliary concepts employed by the former would contain a

greater ejective element than those employed by the latter.

Consider, for example, the concept of wholeness. A piece of coal haphazardly hewn from a seam is not a whole in the same sense in which a machine is a whole, for its wholeness is entirely dependent on the contiguity of its parts, and not upon any supposed internal conditions. Wholeness then, as applied to a piece of coal, contains practically no ejective element. But the wholeness of a machine is different. Its parts are not arbitrarily put together, but are arranged to fulfil a certain purpose. Its wholeness, then, may be mediately dependent on spatial relations, but it is ultimately dependent on the purpose which was present to the mind of the inventor by whom it was constructed. And the machine is only intelligible if this purpose can be analogically inferred. Wholeness then, in this case, is functional, and the concept contains a certain ejective element. But the wholeness predicated by vitalistic biologists of an organism is not merely the functional wholeness of a machine. A single blow may shatter the machine and its wholeness will disappear, the purpose it embodied be frustrated, so that it can only be repaired by the inventor or those to whom he has revealed his secret. But the organism can survive mechanical shocks. Its wholeness is not incompatible with outward change; it is less dependent on spatial relations than is that of the machine and more dependent on a kind of inner individuality. And the organism is therefore conceived as having within it something analogous to

the experience of the inventor. It is, as it were, machine and inventor in one. Within the mechanical system there is at work a directive principle. What then, in the view of vitalistic biologists, is the nature of this principle?

According to Bergson, life, like conscious activity, is unceasing creation. "Our personality" he says, "shoots, grows, and ripens without ceasing. Each of its moments is something new added to what was before. We are creating ourselves continually." So it is with the living organism. It is perpetually creating. Like consciousness, life has the mysterious quality of *durée*. "Continuity of change, preservation of the past in the present, true duration—the living organism seems then to share these attributes with consciousness."[1] And he goes further, and shows that not only the development of the individual but the evolution of new forms of life is due to this innate creativeness. "There is an original creative impulse in life which passes from generation to generation" and which is comparable to a kind of effort, "an effort of far greater depth and far more independent of circumstances than that of the individual." It is this which is, so to speak, the motive-power in the long process of organic evolution.

> Striving to be man, the worm
> Mounts through all the spires of form.

According to Driesch, the principle at work within the living organism is entelechy, a "natural agent

[1] *L'Evolution Créatrice*, 1914, p. 24.

per se," which has the power to suspend a movement for a time on condition that it should recommence at the speed at which it was suspended. By supposing that entelechy can only "hold up" a reaction, Driesch provides for a pseudo-obedience to the laws of mechanics, but at the same time he definitely postulates a non-mechanical agent. However, he is careful to point out that a non-mechanical agent is not necessarily psychical, and that therefore entelechy is not necessarily consciousness. And this is undoubtedly true. But at the same time it is not difficult to see that entelechy is ejectively conceived. It is an agent which has the power of guiding a mechanical chain of causation. It is not itself a link in a chain in which every member is necessarily connected with its antecedent and consequent, but is conceived as a power which can hold up a reaction "for as long a period as it wants," and therefore apparently on its own initiative and for its own ends. Entelechy, therefore, at least involves the idea of cause in the sense which our earlier analysis has shown can only be derived from inner experience, and it is therefore an ejective concept. The differences between the lower organisms and ourselves may be such that Driesch's entelechy ought not to be conceived as consciousness, nor Bergson's creative impulse be conceived as conscious effort; but although allowances must be made for these differences, it is none the less true that the directive principle in each case is only conceivable by analogy with conscious activity. The postulation of such a principle by the vitalistic biologist not only means that he has an additional ejective concept in

his science, but it also serves to modify the significance to be attached to other auxiliary biological concepts, and it therefore makes his whole interpretation more ejective than that of the mechanistic biologist.

But even the vitalistic biological interpretation is clearly differentiated from what may be termed the psychological. It has already been pointed out that each separate science is at least partially self-normative, and that the auxiliary concepts employed by it differ in accordance with its special aim or purpose. Now, whereas biology is primarily concerned with rendering intelligible the *general* facts of life, it is the business of comparative psychology to determine what mental processes (if any) are implied in an *individual's* behaviour towards his environment. It will be more illuminating to contrast the position of the psychologist with that of the vitalistic rather than the mechanistic biologist, but it should be noticed in passing that the psychologist need not necessarily accept the vitalist's views of the autonomy of life.

There are certain kinds of behaviour common to different forms of life, which lead the vitalist to suppose that throughout the organic world there is at work a directive principle—life, entelechy. Now, the facts which lead him to this conclusion do not occur *in abstracto*, but are actually combined with individual peculiarities of behaviour which increase in number and variety as we ascend the scale of organic life. But just as the physicist, who is concerned with the *general* properties of matter, can

ignore the individualizing qualities which distinguish special kinds of matter, so the biologist can leave out of account individual peculiarities, in settling the nature of the directive principle which he supposes to be at work not only in the more complex but also in the simpler organisms. On the other hand, just as the chemist is concerned with the individualizing qualities which distinguish special elements and compounds, so the comparative psychologist is concerned with the inner significance of the various ramifications of organic life. He cannot proceed abstractly, neglecting individual peculiarities, for the question which he sets himself to answer is not the biological one, How can the *general* facts of life be made intelligible?—but, Does the behaviour of this or that kind of organism imply consciousness? If so, of what order and degree? The relation between vitalistic biology and comparative psychology is, then, similar to that between physics and chemistry, the former being more abstract than the latter.

Vitalistic biology contains a greater ejective element than any other science which we have so far examined, but in psychology the influence of the process of ejection is even greater. Psychology has been defined as "the science of the processes whereby an individual becomes aware of a world of objects and adjusts his actions accordingly"; and the bulk of its data must rest on the use of ejection, since it is only in the case of one single individual, namely oneself, that there is any direct or "positive" knowledge of the processes which it is thus the function of psychology to investigate

The cognitions, feelings, emotions, conations, and desires of another are and must ever remain ejects to me. "There is no such thing as direct observation of other minds; all that is immediately perceptible consists of sensible signs and tokens of inward events; and these sensible signs and tokens are interpretable only through knowledge obtained by introspection and retrospection."[1] It has already been shown in the historical study[2] that most modern psychologists frankly acknowledge the indirectness of the so-called "objective" method of their science, by which other minds and their processes come to be inferred from external signs and tokens. And it is difficult to see how there can be any science of psychology without the employment of this method. Suppose it be urged that the psychologist should be content to limit his study to his own mind. In this case all his observations would be direct, but unless there were comparison between observers they would be matters of mere opinion, and on that account could not form the basis of a science. And such comparison would entail the interpretation of the statements of the other observers in the light of the investigator's own subjective experiences; that is, it would imply the process of ejection. The only way in which psychology could conceivably be made an objective science is that suggested, for example, by Hugh Elliot. In order to place psychology on a secure and adequate foundation we ought, in his view, to regard the actions of men and animals as for the

[1] Stout, *Analytic Psychology*, vol. i. p. 14. [2] Pp. 53–6.

most part of the nature of tropisms.[1] Now, if it be admitted that it is the business of the psychologist to collect data of the external behaviour of organisms and not to interpret them in the light of his own subjective experiences, the science does become objective, but in gaining its objective character it loses all that constitutes its claim to a separate existence as a science of mind. A science of outward behaviour is in no way distinguishable from physiology. The only other alternative is to admit that what the psychologist has to do is to interpret the observed outward behaviour of organisms in the light of his own inner experiences. In this case psychology is a science of mind and is distinct from physiology, but it is essentially ejective in character.

This does not mean that it owes nothing to introlation. The analysis of self through introspection and retrospection, the separation of mental states from one another, is presupposed in any systematic reading-in of subjective processes to explain the behaviour of other organisms. But whenever one postulates mind, consciousness or subconsciousness, perceptions, images, memories, purposes, desires, choice, or any other process of mind, of any being except oneself, one is using ejective concepts for its interpretation. And this is precisely what comparative psychology is always doing. Its very difficulties show that its method is essentially ejective. For example, the main difficulty

[1] "The Study of Human Character," *Sociological Review*, July, 1913.

which confronts it at present—the discovery of the specific criteria which indicate the presence of consciousness—is at bottom a difficulty with regard to discrimination in the use of ejection. And similar difficulties are continually occurring even in "human" psychology. Take the case of the correct interpretation of the savage, or the child, or the abnormal. "Why," asks Lloyd Morgan, "are the difficulties of interpretation (of the child) so great? Because we have to interpret in terms of the adult-mind the child-mind, in which the relative development of the faculties, like the relative development of the bodily organs, is so different from that of men and women." [1]

The special difficulties[2] and problems of psychology, therefore, show it to be an essentially ejective science. It is shot through and through with ejective concepts, which are easily recognizable on account of their concreteness. And it is probably this fact which accounts for the tardy recognition accorded to psychology by some natural scientists. But it requires no great perspicuity of mind to discover that vitalistic biology only differs from psychology in degree, and, indeed, that even in mechanistic biology there are employed concepts containing ejective elements. Psychology is certainly more ejective than biology, but it is also more concrete. And if biology uses ejective concepts in accordance

[1] *Introduction to Comparative Psychology*, p. 43.

[2] These difficulties of interpretation are dealt with in some detail in my article "The Basis of Comparative Psychology," *Sociological Review*, October 1913.

with its own aims, it has no right to taunt with over-anthropomorphism a science which employs with discrimination additional ejective concepts appropriate to the problems which it is its special function to solve.

CHAPTER V

THE RELATION BETWEEN A THEOLOGICAL, A METAPHYSICAL, AND A SCIENTIFIC INTERPRETATION OF THE WORLD—CONCLUSION

It will be remembered that the analysis of representative special sciences was originally undertaken with the hope that a clue to the solution of the problem of the coexistence of different serious interpretations of the world would thus be discovered from *within science itself*. It was thought that a consideration of the degree of ejection employed in these special sciences and the deduction of their relation to one another, might throw light on the relation which obtains between theological and positively scientific interpretations of the cosmos, which had previously been shown to differ in degree of ejection. Unfortunately, this analysis has revealed the fact that there is considerable difference of opinion in the modern scientific world with regard to the relation of the special sciences to one another. The question of the recognition of the autonomy of biology is one upon which science as a whole has made no final pronouncement. For the sake

of clearness it will therefore be necessary to consider the two possible views in turn, and to see how each would affect the solution of our problem.

The universal mechanist supposes that the animate as well as the inanimate will ultimately prove to be purely mechanically determined. Mechanics is therefore the basic science and biology is not autonomous. At first sight it might appear that here at least there can be found no possible justification for an interpretation of the world which differs in degree of ejection from the mechanistic. Does not the mechanist indeed explicitly "claim from theology the entire domain of cosmological theory"? It is significant, however, that the modern mechanist admits the mediate interpretations of physics, chemistry, and biology (and also in most cases, of psychology), as well as the primary interpretation of mechanics. Mechanics is fundamental, but these other sciences are allowed to coexist with it because they fulfil special purposes. In order to give the mechanist the best possible case, let us suppose that he does not admit psychology, but only the so-called "objective" sciences. Now, it is possible to arrange these in the order of the degree of abstraction involved. It has already been shown that mechanics is more analytic than physics, physics than chemistry, and chemistry than biology. For example, the biologist takes a relatively synthetic view of the activity of an organism, whereas the chemist and physicist seek to understand it by analysing it into a series of chemical and physical reactions. And the mechanist as distinguished from

the physicist is not content until by analysis he has robbed the concrete data of all individualizing qualities and resolved them into quantitative relations. The special interpretations of the biologist, the chemist, and the physicist differ in accordance with the definite limits which each science sets to its analyses, and it is only in mechanics that the last degree of abstraction is reached. The series — mechanics, physics, chemistry, and biology—are therefore in descending order with regard to degree of abstraction. And they are in ascending order in regard to the degree of ejection employed. It would therefore seem that the more analytic the view, the smaller is the degree of ejection it contains. Or, the more one aims at comprehending the data as a whole, the more one is inclined to an ejective interpretation.

Now, if it is permissible for science to have these various interpretations of a group of data for special purposes, it is surely also permissible to have co-existing interpretations of the whole world which differ in degree of analysis and employ a correspondingly different degree of ejection. In other words, since science admits of the use of ejection as a kind of device for obtaining a synthetic view of a group of data, it cannot consistently deny the use of ejection as a device for obtaining a synthetic view of the whole universe. And in this admission is to be found a possible justification for a theological as well as a positively scientific interpretation of the world. For the main difference which tends to make itself apparent as science and theology become

more and more clearly differentiated is a difference in degree of analysis. The one tends to explain the complex by the simple, the other the simple by the complex; the one to analyse the highest back into the lowest, the other to understand the lowest in and through the highest. Indeed, as Bergson has clearly shown, the ordinary function of positive science is analysis. And it therefore tends to transform into quantitative relations, experiences which in their crude apprehension had individualizing characteristics. For, mental analysis, like physical division, eliminates individualizing qualities. If the process of physical analysis were sufficiently thoroughgoing, the remains of a Venus de Milo would be indistinguishable from those of an ordinary block of marble subjected to a similar process. And similarly the world, which appears to the ordinary intelligence as a rich, varied, and concrete reality, becomes to Laplace's imaginary mind—the type of a perfectly analytic scientist — a dull uniformity of necessary and quantitative relations. It was the realization of the analytic principles upon which science proceeds which made Browning fear that it was destined

> To tread the world
> Into a paste, and thereof make a smooth
> Uniform mound, whereon to plant its flag.

And to the minds of poets and seers this analytic interpretation has always appeared insufficient. "Science writes of the world as if with the cold finger of a starfish," writes Robert Louis Stevenson. "It

is all true, but what is it when compared to the reality of which it discourses?—where hearts beat high in April, and death strikes, and hills totter in the earthquake, and there is a glamour over all the objects of sight, and a thrill in all noises for the ear, and Romance herself has made her dwelling among men."

There is therefore present in every age a strong motive for the continuance of synthetic interpretations as well as analytic descriptions. Indeed, the true distinction between the interpretations of science and of theology is that the principles upon which the latter proceeds are less abstract than those of the former. And this very fact—that theology aims at a synthetic, and science at an analytic view—justifies the former in employing ejective concepts which would have to be accounted over-anthropomorphic as judged by scientific standards. For ejection is recognized even *within science itself* as a legitimate device for effecting syntheses. Men as far apart as Cardinal Newman, with a mind essentially "theological," and Comte, with a mind essentially "positive," agree in their practical support of the convenience of this device. Cardinal Newman, in an interesting passage in his *Apologia*, explains how he made for himself images of personified nations, and suggests that behind his belief in their real existence—which he seemed to think was countenanced by the mention of the "Prince of Persia" in the prophet Daniel and the "angels of the seven Churches" in the Apocalypse—was his sense of the convenience of creating them. And even Comte, notwithstanding all his tirades

against angels and genii, phlogistons and ethers and all metaphysical concepts, employed the ejective mode of cognition as soon as he felt the need for synthesis. His "Humanité," of which he even required his disciples to make a visual image in the shape of some known and loved woman, is a personality. It is not an additive collection of human beings, but is conceived as having a character and unity of its own, just as Newman conceived of John Bull as an individual "spirit neither of Heaven nor Hell." The monotheist, too, makes use of a similar ejective process for effecting the synthesis of the universe. Sometimes it becomes a conscious analogical argument, as in Berkeley's proof of the existence of God in the fourth dialogue of *Alciphron*.

"By the person Alciphron is meant an individual thinking thing, and not the hair, skin, or visible surface, or any part of the outward form, colour, or shape, of Alciphron," says Euphranor.

And Alciphron replies, "This I grant."

"And in granting this," argues Euphranor, "you grant that, in a strict sense, I do not see Alciphron, i.e. that individual thinking thing, but only such visible signs and tokens as suggest and infer the being of that invisible thinking principle or soul. Even so, *in the self-same manner*, it seems to me that, though I cannot with eyes of flesh behold the invisible God, yet I do in the strictest sense behold and perceive by all my senses such signs and tokens, such effects and operations, as suggest, indicate, and demonstrate an invisible God—as

certainly, and with the same evidence, at least, as any other signs, perceived by sense, do suggest to me the existence of your soul, spirit, or thinking principle; which I am convinced of only by a few signs or effects, and the motions of one small organized body: whereas I do at all times and in all places perceive sensible signs which evince the being of God." [1]

Now, if in practice Comte recognizes the convenience of ejection for effecting a synthesis, he has no right to object to the monotheist's use of it for a similar purpose—provided that that use be discriminating. His position would have been far less open to criticism if he had recognized that at every stage of culture it is permissible to have a synthetic or ejective view side by side with an analytic or positive view, and had concentrated his attack on the numerous cases of indiscriminate ejection to be found in synthetic interpretations. For metaphysicians are always confronted with the great difficulty of deciding when and how ejection is legitimate. Their interpretations are not like those of poetry, where differences can be ignored, but they are as seriously meant as are those of positive science itself. And there is therefore not only the constant difficulty of taking differences into account, but often the far greater difficulty of deciding what groups of data are natural unities, which will therefore suffer no distortion on being viewed synthetically. Fechner, for example, avoided the first difficulty, but according to Lotze he succumbed to

[1] Berkeley, *Works*, ed. by Fraser, vol. ii. p. 145.

the second. He synthesized arbitrary unities like the earth and the stars as well as natural unities like plants and animals and the cosmos. Now, the belief that God is the all-containing spirit—the soul of the universe—is obviously less liable to attack than the doctrine of the lesser "souls" of the planets. For it is possible to accept the view that the whole macrocosm is the analogue of the microcosm without accepting the intermediary analogues—that is, without supposing that a *part* of the macrocosm having a more or less arbitrary unity is the analogue of the whole microcosm. The whole is obviously a natural unity, and monotheism, which is concerned solely with its synthesis, thus avoids the main difficulties which confront polytheism and animism. Positive science can therefore raise no objection to the monotheistic interpretation on the score that the attempted synthesis is of data which possess only an arbitrary unity.

But it may be argued that to grant that the cosmos is a natural unity, which can therefore be ejectively synthesized, does not imply that the synthetic interpretation is of equal value to the positively scientific. Ejection is admittedly a device for effecting a synthesis, and it may therefore be argued that its employment makes the synthetic interpretation essentially relative. And in a sense this is undoubtedly true. But if the theologian modifies his data by reading-in consciousness to explain the external creation, the mechanist also modifies his data in spatializing his own conscious life. In other words, if ejection is a device for

gaining a synthetic view, introlation is also a device for obtaining an analytic view. Both monotheistic and mechanistic views are therefore equally relative. They are adapted to different ends; and each is justifiable in so far as it fulfils its own function and does not encroach on the function of the other. In a sense, as Henry Jones says, the two interpretations are neither consistent nor inconsistent: they are simply different. And they are equally valuable and equally relative to human intelligence and purposes. But all human knowledge is relative in this sense. And the vital point to notice is that neither the synthetic nor the analytic interpretation involves distortion. Since the whole cosmos is a natural unity, its synthesis is legitimate: and since, by hypothesis, biology is not autonomous, the analysis of the cosmos into quantitative relations is also legitimate.

But the case is different if we accept the hypothesis, to which modern science as a whole is tending, that biology is autonomous. Suppose that the organic world is not purely mechanically determined. Then the analysis of living psychological unities into quantitative relations is a positive distortion which is open to far greater objections than the opposite error of synthesizing purely arbitrary unities. As we have seen, Fechner probably employed the process of ejection for the interpretation of the earth and the planets in a way that was illegitimate. He synthesized where synthesis was not justifiable—except perhaps for some special purpose which should have been clearly defined. Now, it is possible to fall into the opposite

error, and to introlate where introlation in unjustifiable. According to many modern biologists, to analyse a living organism, a supra-mechanical system, into mechanical relations is to eliminate the essential and to distort the whole. On this account biology can never be resolved into chemistry and physics, in a way similar to that in which chemistry and physics may conceivably be resolved into mechanics: but there must ever remain two recognized groups of sciences; psychology and biology on the one hand, and chemistry, physics, and mechanics on the other. Thus there can never be *one* science of Nature; and the interpretation of the cosmos in terms of mechanics is impossible. To metaphysics and theology therefore belongs the task of interpreting the whole. As Carlyle says: "The universe will not be treated as carrion." There is at work within it a non-mechanical principle which must be reached ejectively if it is to be reached at all. The metaphysician conceives of it as entelechy or life. The theologian, on the other hand, does not shrink from calling it by its highest name—God.

> He dwells in all,
> From life's minute beginnings, up at last
> To man—the consummation of this scheme
> Of being, the completion of this sphere
> Of life.

In conclusion, then, the most noteworthy changes of modern science—for example, the use of the new idea of evolution instead of the old idea of universal causation, the acceptance of a doctrine of vitalism by

some biologists, and the admission of the ejective science of comparative psychology—all these tend towards the recognition *within science itself* that mechanical principles are insufficient to explain the organic world. The days of Tyndall, whose boast it was that mechanistic science would wrest from theology the entire domain of cosmological theory, are long since past. And instead of the dogmatic materialism of yesterday there is a welcome change to the broad-minded empiricism of to-day. It is not so much that scientists have consciously realized the full implications of the recognition of vitalistic biology and comparative psychology, as that the whole temper has changed in a way in line with these specific developments. Consider for a moment the conclusion that could be drawn if science recognized the autonomy of life processes. It would follow that mechanistic science would be incapable of an interpretation of the whole of Nature. For "the ultimate interpretation even of the lowest existence in the world cannot be given except on principles which are adequate to explain the highest." [1] Instead, then, of having, as in the previous case, two interpretations equally valuable and equally relative—the one introlative and the other ejective—we have only one interpretation which can hope, even by long processes of refinement, to become adequate—namely, the ejective. Positive science should therefore be content with the utilitarian function of gaining control over the forces of Nature, and should leave to metaphysics and theology the task of interpretation. "Its object," says Bergson,

[1] Caird, *The Critical Philosophy of Kant*, p. 35.

" is not to reveal the meaning of things, but to furnish us with the best means of acting on them." [1] And the change from the dogmatic materialism of the science of the nineteenth century to the enlightened empiricism of that of the twentieth, shows that science itself is beginning to realize this and to limit and define its functions accordingly.

The most important developments of modern science would therefore seem to point to the view that the true differentiation between theology and science is a differentiation of function. Theology aims at a synthetic interpretation of the universe, science at its analysis for utilitarian purposes. And with the gradual conscious realization of the respective functions of theology and science, which the study of ejective processes has made possible, not only will there disappear the opposition between them which was so marked a feature of the nineteenth century, but co-operation will become possible without confusion. For the surrender of the supreme task of interpretation to theology and metaphysics does not mean that the work of scientists should be without any influence on the final synthesis. If the process of ejection by which this synthesis is effected is to be discriminate, differences and resemblances between the microcosm and the macrocosm must be taken into account. The patient discoveries of science, which may reveal hitherto undiscerned differences or resemblances, should therefore not be without influence on the final interpretation. Thus science,

[1] *L'Evolution Créatrice*, p. 101.

without encroaching on the function of interpretation, will be able to minister to theology, and to fulfil what Wordsworth described as "its most noble use" and "its most illustrious province"—

> In furnishing clear guidance, a support
> Not treacherous, to the mind's *excursive* power.

INDEX

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